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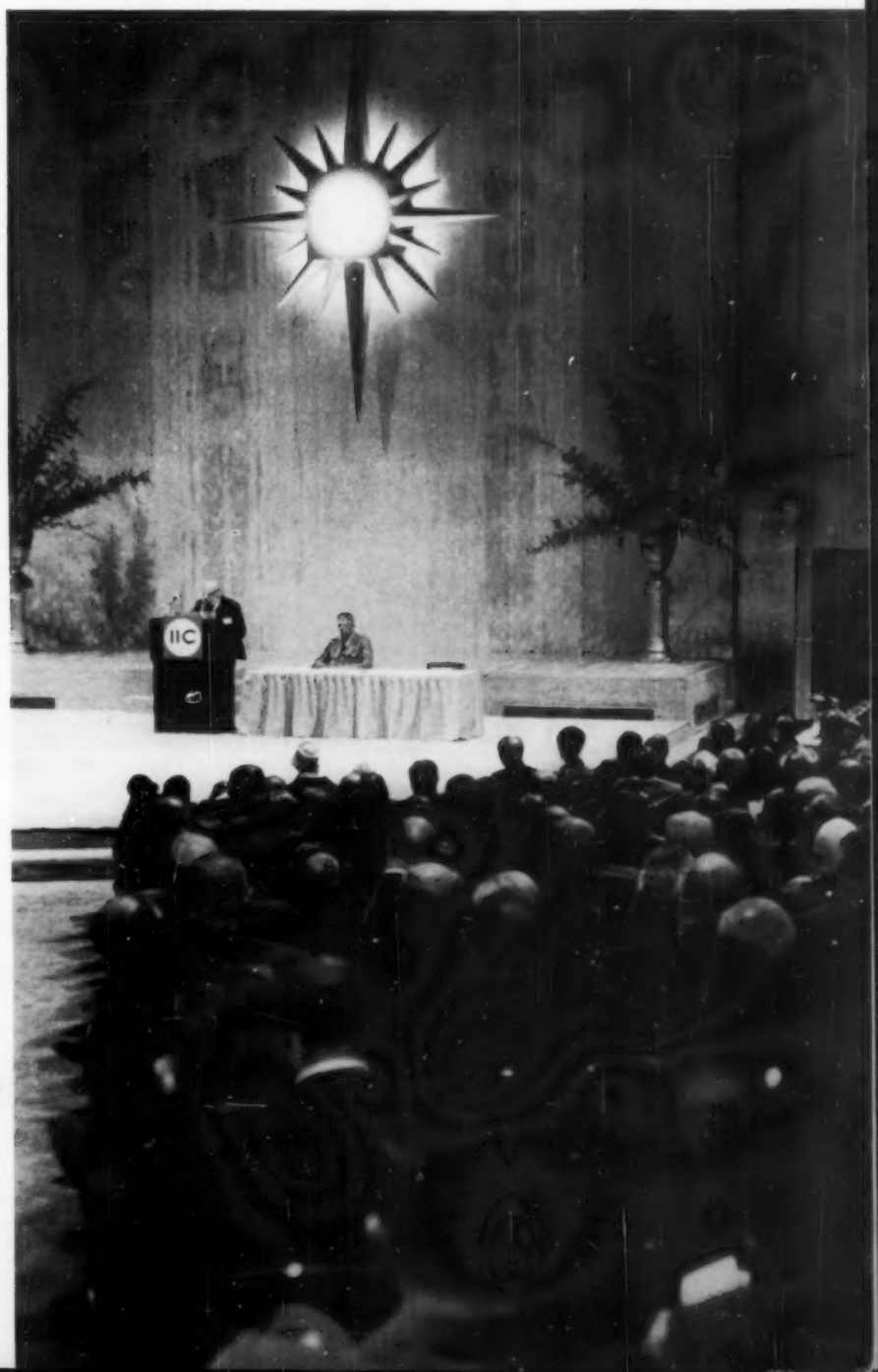
From Vienna: Plain talk by Robert L. Garner (above) on why some nations progress—and others stand still (p8)

From San Francisco: What the world's top executives learned about management development, investment and cost trends, and businessmen's public responsibilities (p6)



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World Affairs

The business outlook . . .

. . . **in Britain** is colored by higher costs and mounting competition, as well as uncertainty about Britain's role in Europe. Imperial Chemical Industries' first-half report, showing a sharp drop in earnings in the face of strong sales and rising exports, reflects problems of business generally. Industry's capital spending, up strongly over last year, shows signs of slowing down some—especially in steel and autos. Overall, the economy is entering a slow, probably mild, deflation.

The pound sterling entered October extremely firm —a welcome sign of confidence at this time of year, but not necessarily proof of any basic improvement in the nation's finances.

. . . **in Germany** is colored by Berlin worries, a new government, and more signs of business slowdown. Export growth is dwindling, and in a recent poll only 3% of German firms expected any export increase through the rest of 1961. Incoming orders have slipped, and the backlog has stopped growing.

. . . **in Japan** is colored by a rapidly-worsening payments position, a consequence of too much boom sucking in too many imports. So the celebrated "double-the-national-income-in-ten-years" scheme will have to move more slowly and, in the view of many, more realistically. But while domestic demand is being curbed, Tokyo promises to continue its import-liberalization program (IM—Feb.).

A yet more intensive export program is getting under way to right the balance. Note these moves:

1. Major trading firms are hurrying up joint ventures in Asia, Africa, Latin America. One firm plans to set up a bank jointly with Lebanese to help finance investment in West Africa. Another plans joint mining deals in Chile.
2. The government will improve export financing arrangements, give better tax treatment to exporters, lower export insurance rates.
3. A new government-subsidized machine tool export group will loan tools to factories abroad in hopes of promoting new business.

Wanted: customers & investors

India too is launching an "export or perish" program. It is a two-pronged scheme:

For traditional products like jute, tea, textiles, the government will try to increase sales by granting more substantial tax reliefs and subsidies. **For "new exports"**—light engineering goods, textile machinery, possibly locomotives—there may be penalties as well as incentives. A possibility: no approval of expansions or new plants unless the promoters promise to push exports. The Indians are anxious that foreign firms entering manufacturing plan on exporting.

A major new effort to attract U. S. businessmen began with the opening last month of an investment center in New York. Indians are explaining to Americans that private business is the most dynamic sector of their economy—despite the importance of state enterprises, and are offering attractive financial incentives and a much more flexible attitude toward foreign capital.

Generally speaking, the Americans seem favorably impressed with India's progress, and business opportunities there. Last year 42 companies entered financial and technical agreements in India, and there were 14 more in the early part of 1961.

A businessman's revolt?

President Nasser had just about completed the total nationalization of all business in the United Arab Republic when he found it was not united any more. The Syrian revolution appeared last month as strictly a merchant-class affair, one result of Nasser's July decree which forced private Syrian trading, banking, and industry to finally merge with Egyptian state enterprises.

Rebuilding the Syrian economy will be difficult. Private enterprise has been on its deathbed; three years of drought make matters worse. There is the problem of unscrambling the companies whose assets were merged with Cairo.

For the Middle East generally, hopes that the Arab lands were making some progress toward economic cooperation (IM—Aug. p 1) have been dashed.

Flicker of confidence

While the government hews to its stern racial policies, business in South Africa looks better. After a disastrous fall, reserves are climbing again; so are exports, and there is the first flicker of confidence on the part of the world financial community. To wit: Rand Selection, the union's largest investment company, borrowed $30-million on favorable terms from American institutions—believed to be the biggest loan ever raised by a South African company from private investors abroad.

On Long-Range Planning

"Europe was divided into many . . . self-contained economies which were separated by a multitude of trade barriers. In such clearly defined markets of limited absorptive capacity and purchasing power, management was mostly a matter of day-to-day decisions."

That was Dr. Hans-Guenther Sohl, President of the Thyssen Steel Group in Germany, talking in San Francisco (see "Facing World Responsibilities" on another page) about the way things used to be in Europe. No more. Now rapid economic integration, and the appearance of a buyers' market, are creating conditions where "day-to-day" management, relying solely on experience, intuition, and instinct, is no longer enough. Said Sohl: Long-range planning is becoming "indispensable" to management.

This month businessmen in Europe—and throughout the world—are poring over budgets for 1962. The more fortunate (or foresighted) among them have the benefit of market research, cost experience, and systematic thinking to aid them in their task. And an increasing number of businessmen are not just looking at 1962; they have a pretty good idea of where they want to be in 1964 or 1965 and what they must do to get there.

This is not only true of the big corporations—the Thyssens of the world, although they are probably farthest along in long-range planning. It can be done by the small manufacturers and the two or three-man trading firm too. It is all characterized by the expression "management by objectives."

Listen to Pieter F. S. Otten, President of the Board of Directors of Philips Lamp, describe how he and his company look at planning. Whether you are running a sprawling world electrical empire or are in business for yourself, the principles hold.

Otten's first "fundamental law": "The planning must be a mental attitude, a continuous, uninterrupted thought process." A policy, says Otten, is not a basic decision engraved on the office door, it is an organism that must grow, be regularly reviewed and adjusted, constantly filed and polished. It is impossible to draw up a five-year plan, unemotionally comparing forecast and reality as it moves along, and then when the period has elapsed draw up a new one.

The second fundamental law reads "Compel those who you have made responsible for carrying out the plans to discuss them with you regularly from time to time." This means to regularly take stock of the suitability of the plan for current situation—in the firm itself and in the economy. In other words, keep yourself informed. And, equally important, keep everyone in your organization informed.

Which leads to the third law: "Make your plans by starting at the bottom." It is a problem of communications. If management's directives penetrate to the lowest level management will have available the knowledge available at this level. "The man is perhaps not aware of it," says Otten, "but you often obtain the most valuable information with regard to the market from the man at the front, from the reports of the travelling salesman."

In short, absorb everyone, from president to salesman, in the system of planning.

In Europe or anywhere else, says Otten, the modern entrepreneur is no longer a person who simply drifts along with the current of the economic cycle and makes do with keeping his boat away from the banks, at the same time—and usually without any grounds—counting on getting through the next rapids unscathed. He must indeed help to canalize the current and to regulate the rate of flow.

Business with Russia

1. Soviet trade with West Europe may slow down some—despite the high hopes expressed in connection with the various trade fairs held earlier this year (IM—Aug.p16).

The Soviets have been buying more from Western Europe, but selling a bit less. As a result, their usual trade surplus, used to finance purchases from raw material-producing countries, is narrowing fast. This could mean increasing sales of Soviet gold on the London market in a few months' time.

The Soviets are still having trouble offering a sufficiently diversified, high-quality product line to attract larger sales. Even timber, a staple Soviet export, is running into severe competition. And petroleum sales have apparently not been growing quite as fast as expected earlier this year.

2. Sometimes businessmen buy Russian when they would rather not. From Germany comes a report on how several manufacturers there have bought Soviet machine tools for fear of losing substantial export orders from Moscow. "We were prepared to use Russian-built machines for rough work even though they were costing us almost as much as precision-built German tools," said one.

The machines have not done too badly, according to a report in McGraw-Hill's *Metalworking Production*. "Rugged and ragged" was the verdict of one purchaser. Spare parts can be a problem, but service has been supplied by technicians sent out by the Soviet sales agency. Price? Apparently not far out of line, and at least one German firm is contemplating replacing obsolete machines with new Soviet units costing appreciably less than comparable European tools.

Obviously the Russians want to make a show of their tools in Germany, for political as well as economic reasons. Sales agents are offering lists of German and Austrian factories using the tools, and potential buyers are invited to go around and see for themselves, and talk with the users on the spot.

American Letter

An expectant economy

For months now, the U.S. economy has shown signs of giving birth to a boom. As the pregnancy now approaches its critical phase, businessmen are acting a bit like expectant fathers. Will it be a man-boom or merely a girl-boom? Might it perhaps—perish the thought—be a boom unworthy of the name?

Reacting to the anxiety, stock market prices developed a mild case of jitters. And the world situation did nothing to ease the domestic tensions.

Current expectations can be seen in the record output of paperboard in the past few months. In recent years, this unglamorous material has earned a reputation as a reliable barometer of consumer demand. Why? Because paperboard is used almost exclusively for packaging materials—wrappings for goods in transit, packages at the retail level—and display materials. Thus it is closely linked to consumer spending. Note that paperboard exports to Europe have been running at a record rate, keeping pace with the growth of consumer credit and self-service retailing there.

The build-up of packaging materials means that the businessmen are betting on the consumer. His income is at a record level; he is not loaded down with installment debt. But there is still the nagging question—will he perform as expected?

Prices: steady to lower

"There was a time, not so many years ago," comments New York's *Journal of Commerce*, "when prices of some commodities or materials, particularly those that are imported, would have skyrocketed on the slightest war scare. Now, the markets refuse to budge even when shooting breaks out in various parts of the globe."

The last time that prices showed any real reaction to international tensions was during the Suez Canal crisis five years ago. During the latest Berlin crisis, even the commodity futures market did not react.

What is the outlook for prices now? General industrial prices in the U.S. will likely hold within a narrow range over the next few months, according to McGraw-Hill's *Purchasing Week*. The price tags on the new auto models, considered a bellwether, set a "hold-the-line" pattern. Also in recent weeks, producers of several key commodities, such as polystyrene, stainless steel, and metal conduit announced price increases—and then had to cancel them. *Purchasing Week* doubts that other recent price increases, in bearings and lift trucks, for instance, will hold. Of course where demand is especially strong, as with paperboard, higher prices may still be expected.

But where price structures are weak, the pressure is for lower prices. Except for tin, price weakness has been evident in metals markets for some time. Then came a "shocker"—the first price cut on aluminum ingot in nearly two years.

The effect of lower ingot prices is worth noting. Over the past few years, prices of finished aluminum products fell while ingot prices held relatively firm. Integrated aluminum companies did not suffer greatly from this; they get their ingots at cost at their own smelters. Independent fabricators, on the other hand, must buy their ingots at a premium and then compete with the integrated companies in the product market. (The price cut on ingots was initiated by Aluminium, Ltd., of Canada, which does not fabricate.) Thus the fabricators were caught in a squeeze.

To some extent, the tables have been turned: The profit squeeze is relieved somewhat for independents, increased for the integrated producers.

Changing attitudes

Foreign investment, like commodity prices, is showing its independence of war scares. "Crises are here to stay," the president of a major U.S. corporation told *Business Week*. Another company that cut back during the Berlin blockade of 1948-49 says: "Berlin has not affected foreign operations in any way."

Steel companies offer a notable example of U.S. businessmen sticking by their plans. "Go international or else. . . ," warned a steel executive last summer (IM—Aug., p 21). And last month, United States Steel Corp., the world's largest, announced its first overseas venture—a stainless-steel enterprise in Italy, to be operated jointly with Terni-Societa per L'Industria a L'Elettricita.

United States Steel thus becomes the third U.S. steel company to "join" the European Common Market, rather than try and fight it from the outside. Allegheny Ludlum is building facilities in Belgium, Crucible Steel in Italy. All three will concentrate on specialty steels. A fourth company, Jessop Steel, has announced that it will participate in a joint venture in India with Vummidiars Private, Ltd.—a $5-million alloy steel plant in Madras state.

At the same time, note a marked disenchantment with Latin America among U.S. businessmen. "Never since World War II has there been less interest in this area among private investors," *Business Week* observes. The reason: Businessmen fear that attempts to foment revolutionary social changes will get out of hand or lead to Cuban-style Yankee-baiting.

Letter from San Francisco

Guests at the recent International Industrial Conference held here found little difficulty in adjusting to this West Coast, U.S.A. city. Visitors invariably notice that, despite a businesslike atmosphere, there is something curiously gentle and graceful about San Francisco.

Perched on a narrow, hilly peninsula, overlooking one of the world's great harbors, San Francisco is considered the most beautiful large American city. Its citizens are open-minded and cosmopolitan, traits that trace back to the "Gold Rush" days of the last century. For some years following World War II, however, the city suffered a slow but steady urban decay.

San Francisco is now reclaiming its heritage as an international trading center, and as the gateway to western U.S.A. There is a procession of tall new buildings downtown, coupled with a burst of civic pride in the "Golden Gate" City.

Two trends of the past decade speeded this renaissance. One is the emergence of the trans-Pacific-Asia region of the world as a dynamic trading area. The other is the westward migration of population and industry within the U.S.A.

Today, only about 15% of the U.S. population lives west of the Rocky Mountains. But one in four of these 26-million people arrived between 1950 and 1960, and the movement continues. By next year, California expects to be the most populous state in the Union.

Already, several of the nation's business giants are based in the San Francisco "Bay Area": Kaiser Industries, with 104 plants in 21 U.S. states and seven foreign countries; Standard Oil of California, with a petroleum empire stretching from Alaska to Saudi Arabia; the world's largest bank, Bank of America; the second largest railroad and the second largest public utility. Then there is Crown Zellerbach Corp., an important paper manufacturer, and the Bechtel Corp., which has built oil pipelines across countless kilometers of desert and jungle around the world.

The Bay Area is becoming a center for the electronics and nuclear-energy industries. Hewlett-Packard is now the world's largest manufacturer of electronic instruments. Ampex recently shipped $300,000 worth of television tape units to Britain and Egypt from its San Francisco plant. General Electric's Atomic Power Equipment Dept. here has shipped nuclear reactors to Japan, Philippines, and Europe.

Thus San Francisco again has solid credentials as an international business center. And its trading activities grow alongside the local industry. Last year, $547-million worth of goods passed outward from the city, $469-million worth came in. Matson Steamship Co. and American President Lines are stepping up their "containerized" vessel service to the Far East. And San Francisco's port facilities are undergoing a major expansion.

Britain and Japan maintain the largest trading centers in San Francisco, but some 54 nations now have either consulates or commercial representatives in the city. San Francisco sponsors an annual Pacific Festival, bringing in business leaders from Asian nations for an exchange of views on trade problems.

In recent months, San Francisco has turned its attention to the new African nations (an interest stimulated by Kaiser Industries' role in the proposed Volta River project). In September, "Africa Week" was celebrated, and representatives of 16 nations were on hand for briefing sessions with local businessmen. San Francisco naturally hoped that these and all the other international business visitors took home a pointed message—that the rich and growing West Coast American market can best be reached through the Golden Gate.

Displacing exports?

Sales of goods produced abroad by branch plants and affiliates of U.S. manufacturing companies are rising much faster than exports of U.S.-produced goods. Latest figures released by the U.S. Dept. of Commerce show a 29% gain for overseas manufactures and mining from 1957 through 1960, compared to a 5% gain for exports.

This trend is disturbing to many businessmen because overseas-produced goods seem to be usurping U.S. export markets. But there's a strong counter-argument: Foreign manufacture may be the only way to hold on to important markets.

Total sales of overseas-produced goods totaled $24,000-million—as compared to about $11,000-million in exports—and the total in 1960 does not include petroleum sales, which would add at least another $12,000-million. Commerce officials say the total will be "considerable higher" in 1961.

Geographically, Western Europe saw the biggest increase in 1960—to total sales of $9,300-million. Sales of U.S. companies in Latin America grew to $3,200-million, up from $2,800-million in 1959.

Country by country, U.S. affiliates did their biggest business in Canada with $8,900-million worth of goods sold. Next came Britain with $4,700-million, West Germany with $1,800-million, Australia with $1,000-million, France with $965-million, and Brazil with $879-million. Relatively speaking, the greatest gains came in Argentina, with a 60% gain over 1959 to $696-million, and in Italy, with a 40% gain to $350-million.

Transportation equipment (including aircraft) and mining are the two industries most responsible for the total sales increase. Transportation equipment accounted for 40% of the over-all $2,500-million increase in total sales between 1959 and 1960. Mining operations accounted for total sales of a similar $2,500-million in 1960, up about 15% over 1959.

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Problems we encounter ...

Water purification and treatment is an acute problem in many parts of the world nowadays. The raw water obtained from rivers, lakes and underground sources is rarely clean enough to be used as drinking water or even for industrial requirements. The illustration shows a model of a water treatment plant at present under construction at Kasserine, Tunisia. This plant will produce hourly 820 cubic meters of drinking water and 165 cubic meters of fully demineralised water from surface water for a pulp mill and its auxiliary installation. The treated water will serve for the production of chemicals, for pulp processing and also as feed water for a steam power plant.

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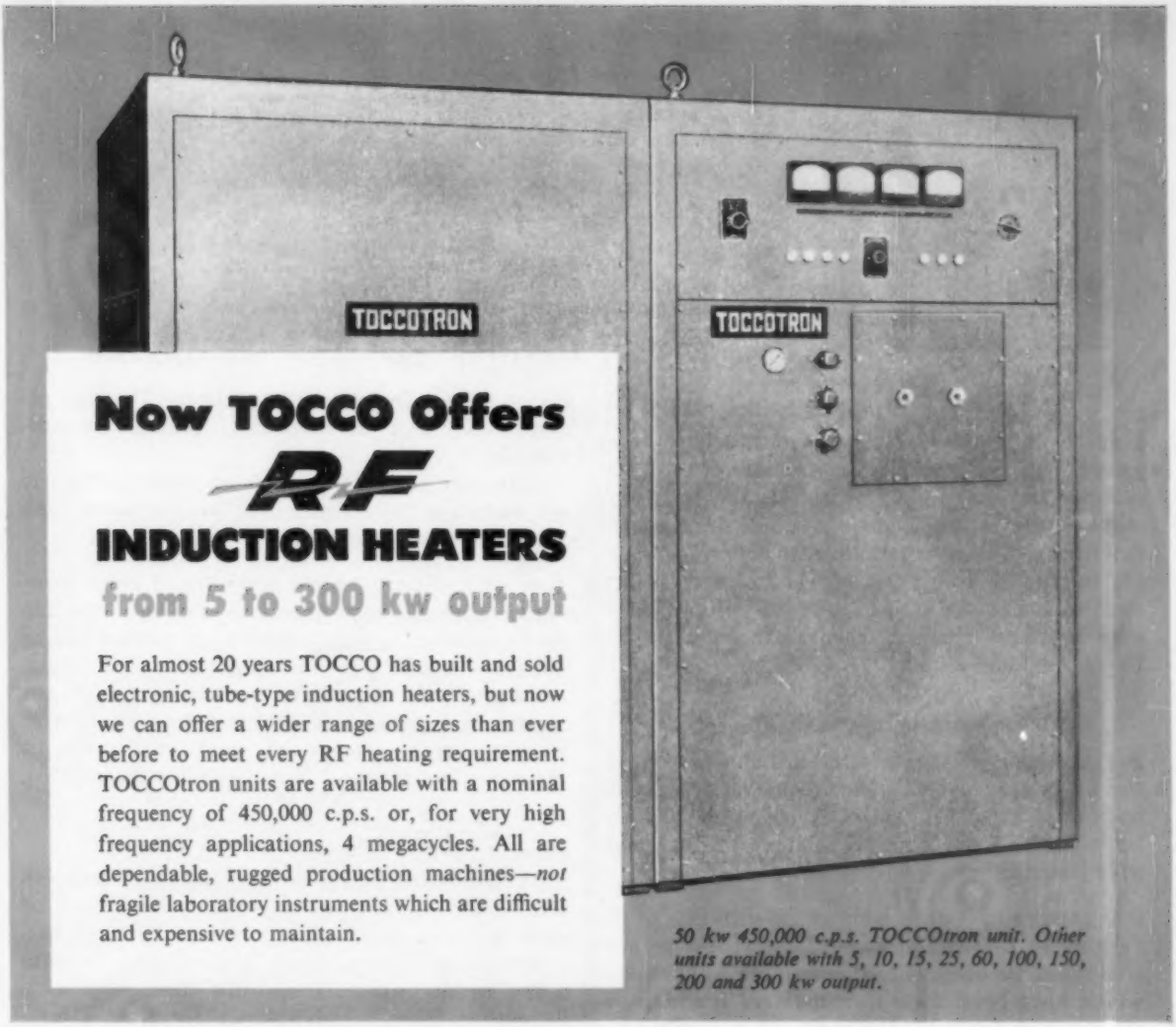

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Robert L. Garner (left) retired last month after a distinguished career as a banker and businessman. During the last 14 years, he has been Vice President of the World Bank and, since 1956, President of the International Finance Corp. Mr. Garner's sympathetic understanding of development problems is great; his impatience with state control, financial imprudence, and everything he considers fuzzy thinking is equally great—as many who have crossed swords with him well know. His speech to the Vienna meeting of the Bank and IFC was, as he termed it, his "valedictory" spoken as an individual and not as an official of an international organization. Here are some Garnerian reflections . . .

. . . On Foreign Aid

I am troubled by the extent to which there is growing up the insidious consequences of too great reliance on foreign aid . . . there are too many instances where the obvious attitude is that the chief responsibility of a government is to secure the maximum help from abroad, with lesser responsibility to mobilize its own resources, and to take action so that all resources are most effectively applied. . . .

. . . On "Under-Development"

Perhaps most often lack of capital is blamed. . . . In the first place, there is in most developing countries more potential capital than is admitted. But large amounts are kept outside . . . or are otherwise hoarded.

It is popular to charge colonialism with lack of development. . . . This argument seems less persuasive when we observe that a number of countries which have been their own masters for long periods are no further advanced.

I am therefore forced to the conclusion that economic development or lack of it is primarily due to differences in people—in their attitudes, customs, traditions and the consequent differences in their political, social, and religious institutions.

Therefore, if the countries which are lagging are to join in the procession of economic progress their people must change some of their thinking and some of their methods.

. . . On Development

The effective spending of large funds requires experience, competence, honesty, and organization. Lacking any of these factors, large injections of capital into developing countries can cause more harm than good.

Modern machines and the way of life which they demand can produce unlimited goods and services, but only for those who accept the required disciplines. Such disciplines are harshly imposed by the ruling powers in communist countries. In free societies they must be voluntarily assumed by individuals.

I am sympathetic with those who prefer the old ways and the simpler life. But too many wish for the best of both worlds.

The mass of people have never found quick prosperity through expropriation—through dividing up an inadequate pie. Grabbing the possessions of the few does not really help the many. But revolutions are likely to come unless those who have the wealth and power are prepared to cooperate in working out means whereby productivity can be increased and its benefits more widely distributed.

. . . On Inflation

There are many prominent supporters of inflation who claim that it is a necessary adjunct of growth; some assert that it creates development.

But I have taken a close look at inflation in quite a few countries . . . I continue to class it as a dangerous fever, which gives the patient a temporary spurt but quickly saps his strength.

. . . On Private Enterprise

The most productive economies which have brought the highest living standard to the most people have been those which have permitted private initiative to control the widest range of activities.

The time has come when no longer can businessmen afford to concentrate exclusively on their individual enterprises and to ignore their role in promoting the broad interests of their countries. . . .

Furthermore, they should realize that the institution of private enterprise is under deadly attack. . . . Business generally has not effectively taken up the challenge. It has, by default, allowed itself to be put on the defensive. Unless it awakes to the present danger and determines to pay the price and make the fight to preserve and expand its system, its productive contribution may be lost to the world. . . .

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250 - 499	US$ 2,39	US$ 0,94	60 %
500 - 999	US$ 2,07	US$ 0,84	59 %
1.000 and over	US$ 2,07	US$ 0,76	63 %

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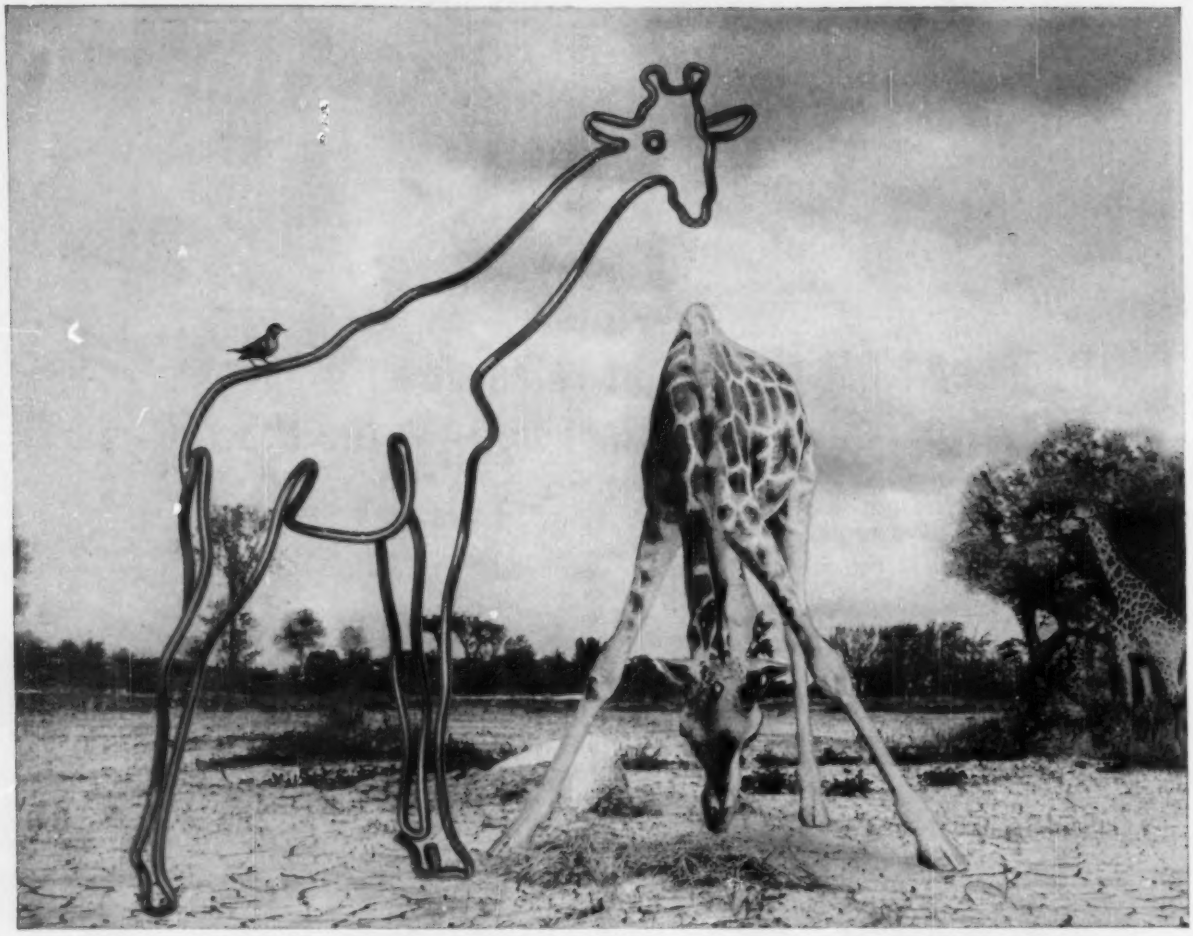

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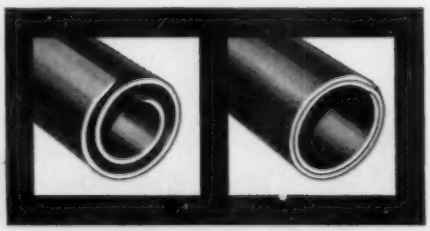

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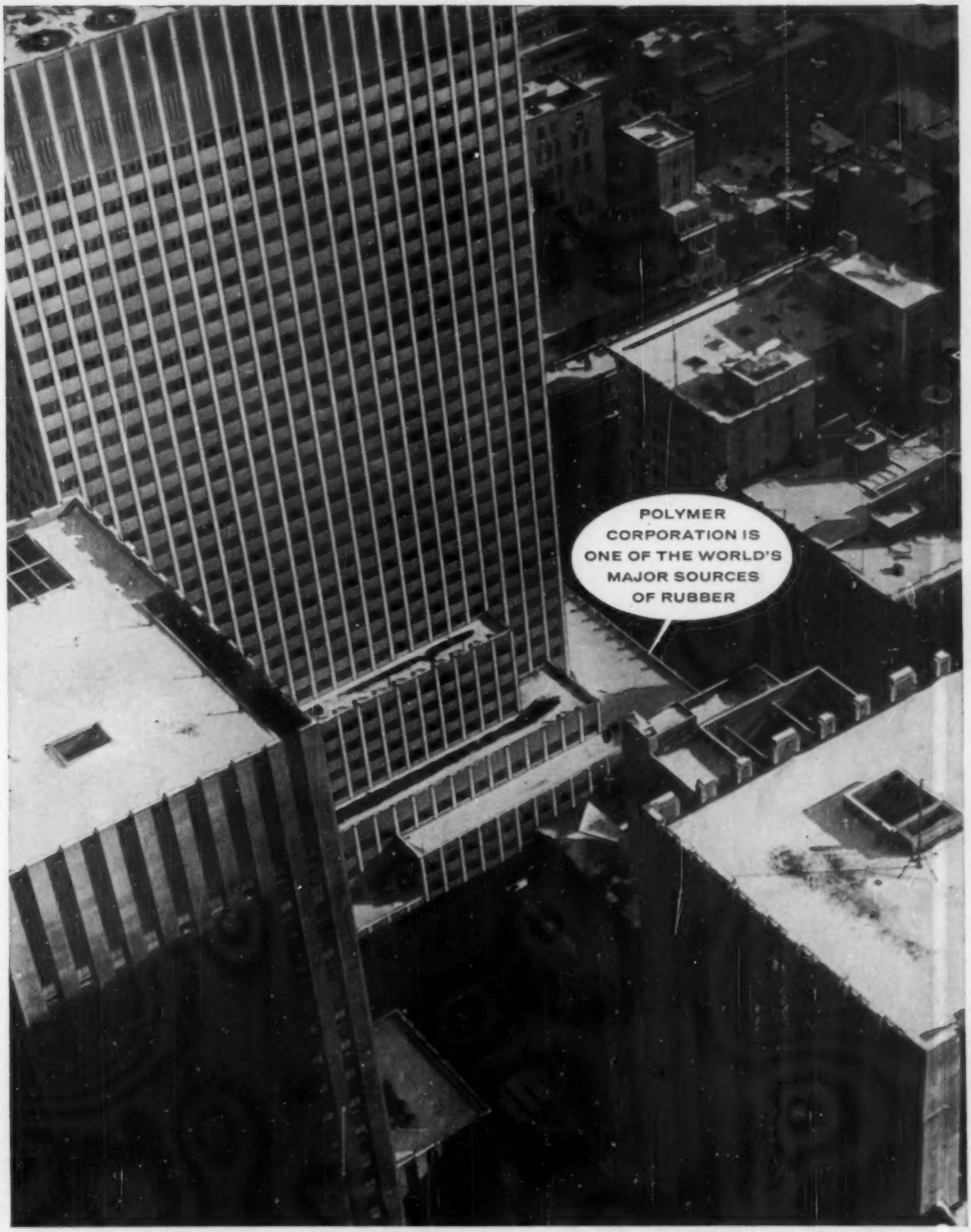

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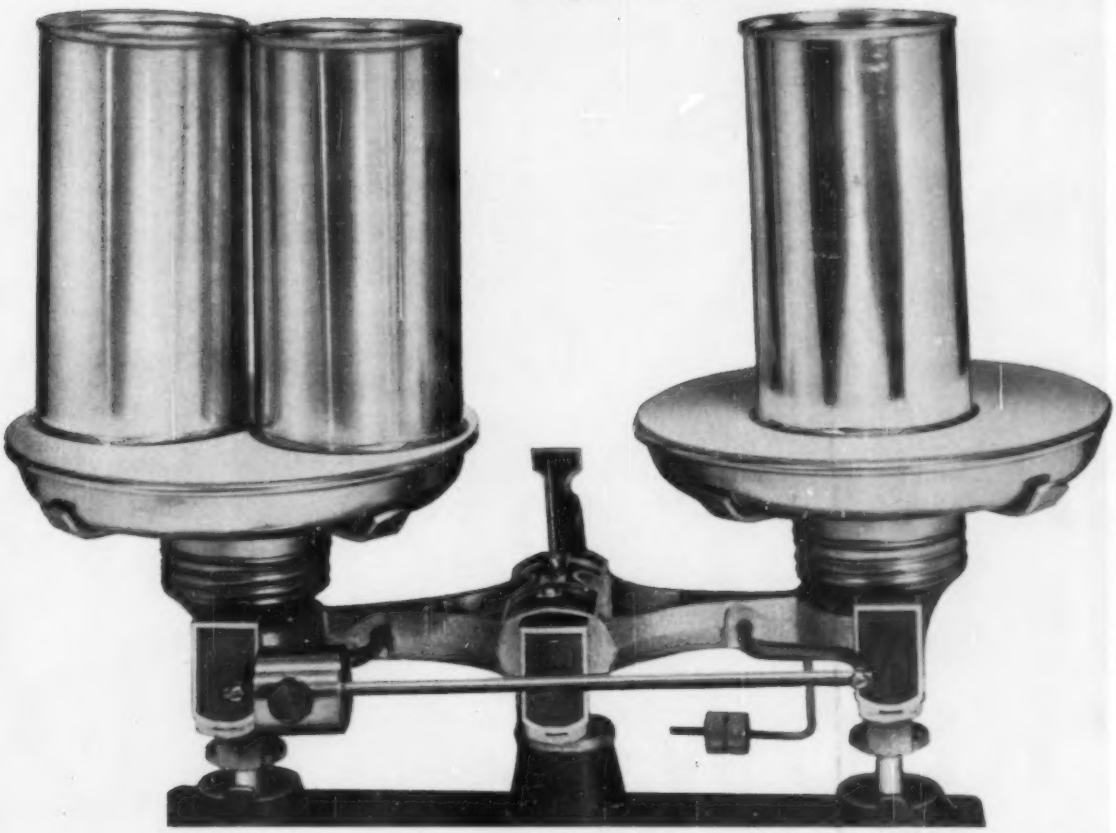

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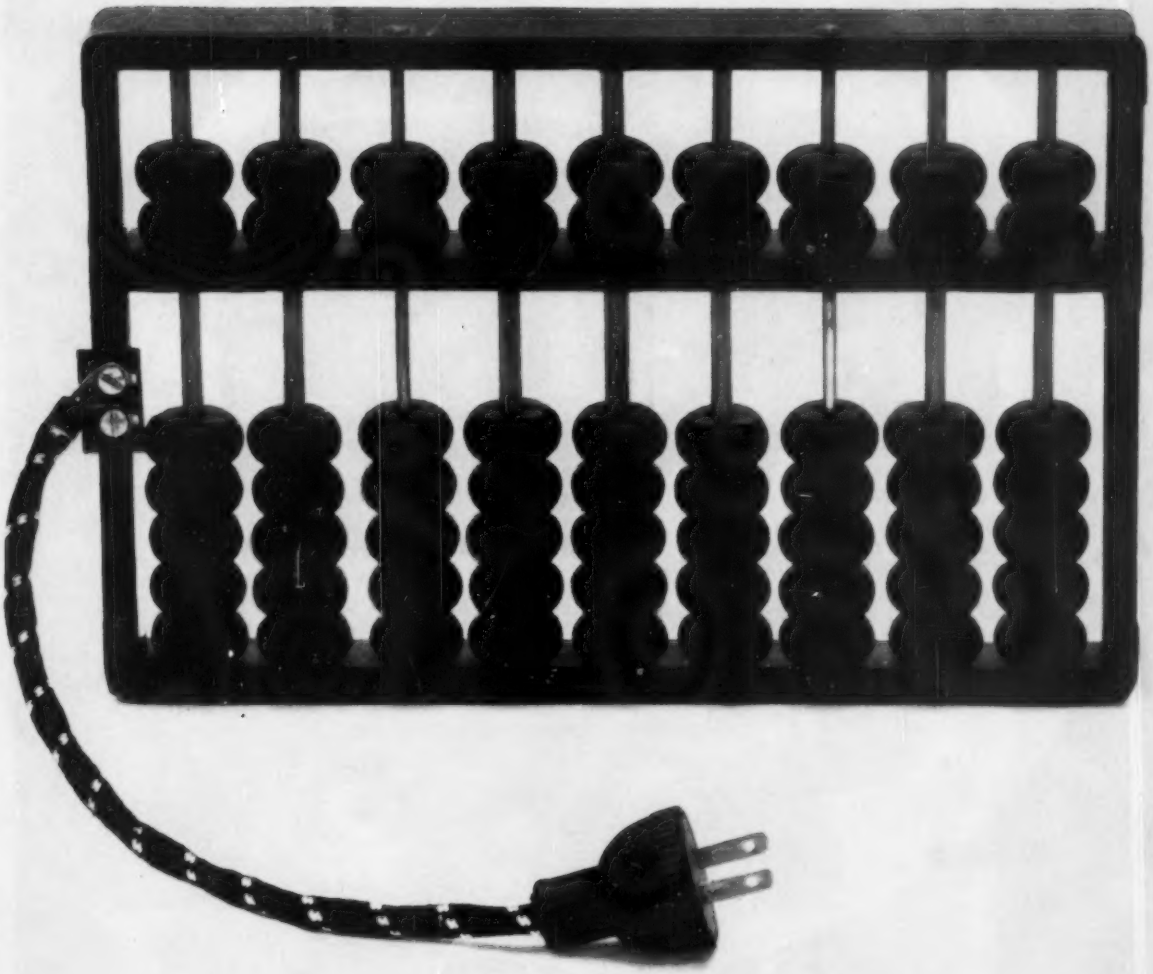

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Just in case you'd like to be an electric adding machine manufacturer, we have a little friendly advice.

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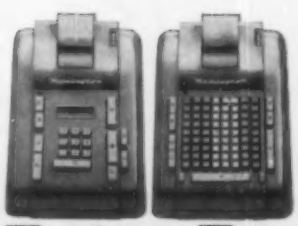
If you *don't* want to go into the adding machine business, buy a Remington.

If you *do* want to, buy one anyway.

It's a very good one to copy.



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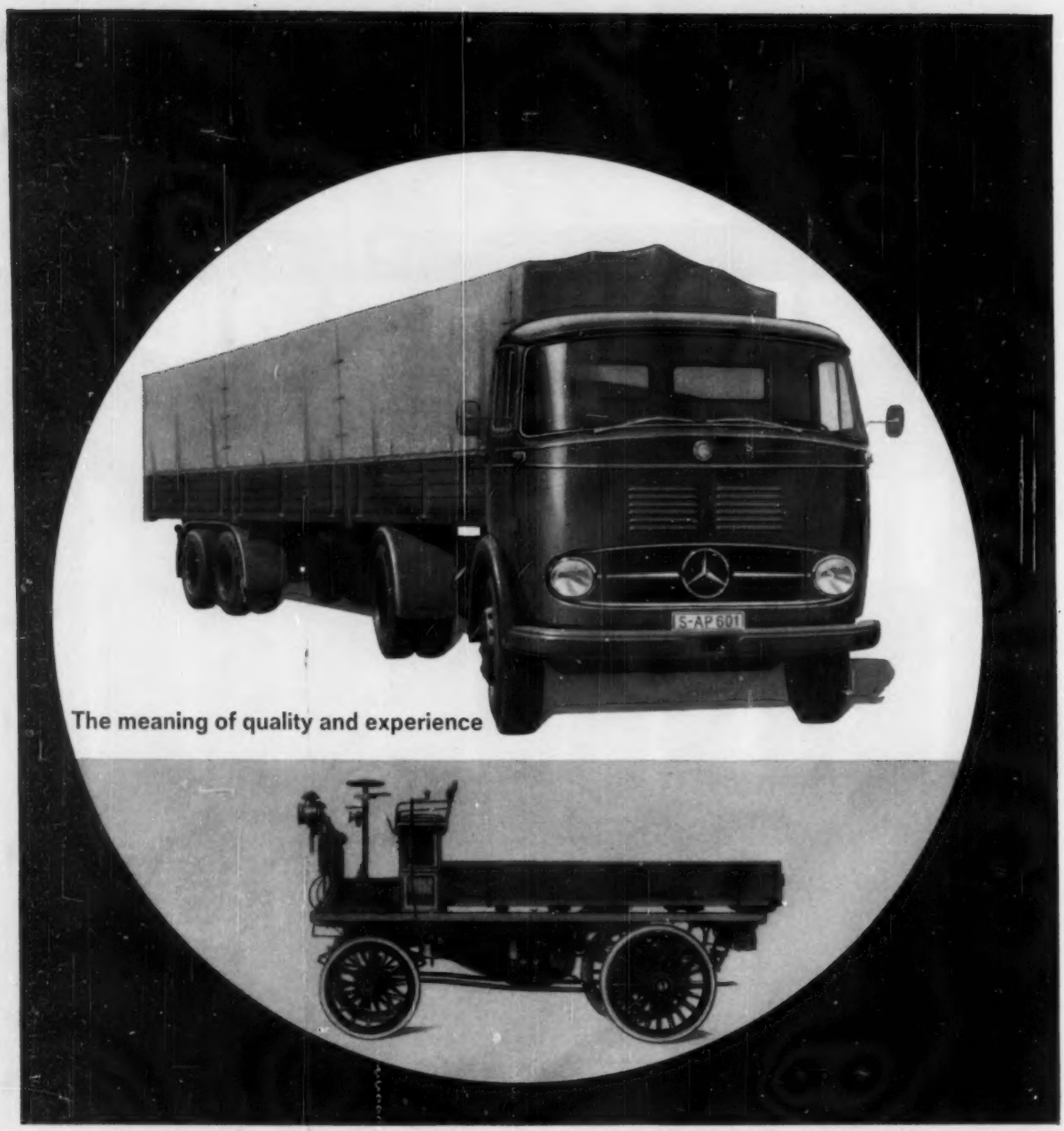

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75 YEARS OF AUTOMOTIVE ENGINEERING 1886-1961

MERCEDES-BENZ

158 AJ

". . . the productivity of our free society depends on the initiative of its individual units . . ."
Neil H. McElroy

1. Facing World Responsibility

International businessmen at San Francisco find private enterprise on trial for its life.

Their thinking, plus new reports on management, costs, investment on the pages that follow.

ONCE UPON a time, the few occasions when business moguls of the world got together were narrow, secret affairs. Only a handful were involved: Some bankers did a deal, a few industrialists straightened up their cartel, with minimum concern for the community as a whole or their responsibility to it. "The public be damned" was the attitude of many.

Today deals are still done and, no doubt, cartels arranged. But you needed only to listen to a few of the 600 business leaders at the International Industrial Conference at San Francisco in September to realize that the community bulks large in their thinking. Even if he wanted to, today's tycoon cannot hold himself aloof. He is up to his neck in public responsibility.

• **Change** — Why the change? Partly it is the instinct for self-preservation. In a grim keynote speech, John McCloy, retired Chairman of the U.S.A.'s Chase Manhattan Bank and presently a disarmament adviser to President Kennedy, told the industrialists and bankers at San Francisco that "There may very well be no industrial problems to worry about if we do not look up from our concentration on producing and marketing problems and start thinking right away as to how we are to solve the greater issues with which the world is now faced."

Partly it is opportunity. Neil McElroy, Chairman of Proctor & Gamble Co. and general chairman of the meeting, put it simply: What greater business opportunity could there be than to help "half of the world's population striving now to find the means to become effective customers?"

• **Mood**—Once the mood was set, and it was a somber one, the International Industrial Conference got down to its major concerns—strengthening private enterprise, especially in the developing nations; and, close to the businessmen's hearts, the development of better managers. Unlike some gatherings of big businessmen, which dispense much hot air and little else, San Francisco produced a lot of provocative thinking. And it served as a convenient moment for the publication by the meeting's sponsors of several new studies of world business matters.

The Conference was sponsored jointly by two non-profit American business and scientific research organizations—Stanford Research Institute, affiliated with Stanford University in California, and the National Industrial Conference Board of New York. Both are moving rapidly into the field of international business and economics. Attendance was by invitation only; no doubt some would-be business statesmen in the world were miffed by not being included.

The idea of the Conference was for the participants from developing as well as industrialized nations to explore mutual interests. It produced no ringing statements of policy for the public; it was not designed as a sounding board. In a real sense, the businessmen were talking among themselves.

• **Plain Talk**—There was some plain talk. Dr. Paolo Rogers, of the Olivetti Co., took private business to task for its "discouraging" record in explaining its part in the process of economic development. He produced figures that suggest that private investment, private loans, participations, and export credits have accounted for 30% to 40% of all assistance flowing to the developing nations over the past five years.

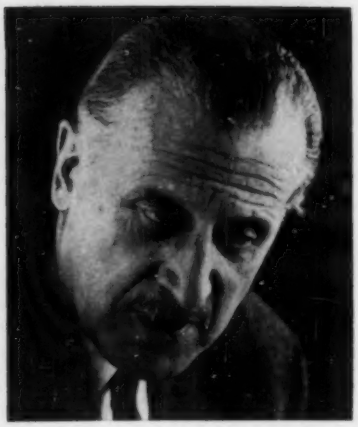
Yet for some reason "the collective manifestations of the private sector show an appalling weakness," said Rogers. "The private sector places itself on the defensive or, at the other extreme, adopts an unduly aggressive and antagonistic attitude toward the role of government and of the public sector."

He added this challenge: "The question is whether private enter-

What they said at San Francisco . . .

DR. ALEXANDER KING, OEEC: At a time when we need faster growth, investment in managers is vital.

THOMAS J. BATA, CANADA: Appointment of the right people to the right places is my preoccupation.



ARTURO ALDUNATE, CHILE: At least five of our big universities now are giving training in management.

prise will be enlightened and aggressive enough to undertake what clearly appears to be an uphill effort, where risks and unknowns are great, where the short-term outlook is dim, where the very aim and purpose of private enterprise, namely the expectation of profits, is conditioned by abnormal factors." He called for a new "private diplomacy —to precede, second, and protect private business abroad" as a complement to public diplomacy.

• **Refrain** — Ideas like these popped up again and again. Many speakers—among them Sir Oliver Franks of Lloyds Bank, Sven Aberg of L. M. Ericsson, Enrico Bignami of Nestle, Abol Hassan Ebtehaj of Iranian Bank, Sir Leslie Rowan of Vickers, Henry C. Alexander of Morgan Guaranty Trust Co.—indicated their conviction that aggressive business leadership can prove that private enterprise can work in developing nations—and can work with the usually nationalistic governments there. It may require a good deal more flexibility on the part of many executives. Several speakers stated flatly that in developing nations, economic planning and central control—usually a bete noire of business—may be a basic condition for private enterprise's success.

Very quickly the future of private enterprise came around to the quality of the men who lead it. The participants at San Francisco agreed that a critical shortage of qualified managers threatens economic development everywhere.

2. Management is the Key

Many students of management have observed that the typical industrialist tends to downgrade management development efforts. But as Pieter Otten of Philips Lamp put it, the accent today has shifted from "solitary leadership to teamwork, from intuition to systematic thinking." Except during an enterprise's very early stages, one-man management has little place in the modern world.

Management development is even more essential in newly-industrializing lands. Sir Nutcombe Hume of the Charterhouse Group in Britain said that it is "useless to begin to plan and scheme for aiding development unless satisfactory efforts have been made to select and maintain good management." Sir Leslie Rowan put the argument more strongly. Speaking of all the aid extended by international organizations and others, he asked "whether there has not been a tendency to allocate too much effort to machines and factories, and too little to the human beings who will be essential to run them."

Joseph Grazier, President of American Radiator & Standard Sanitary Corp., voiced the underlying theme of the Conference with the observation that even the most capable of the assembled businessmen at San Francisco could not lead much longer "without careful and planned attention to professional management."

• **New Study** — A series of research studies by the National Industrial Conference Board, presented to the Conference, backed up the discussion with facts and scholarly argument on management development in eight countries.* It reports progress, but it is clear that the brave words of the Conference on management development are a long way from realization. Indeed, the report says that in some countries "it is considered an insult to suggest that a successful top manager might benefit from exposure to information about scientific management."

Here is a summary of the researchers' findings:

• **Chile** — In-company executive training programs do not exist. Those few companies concerned with management development are primarily interested in courses conducted outside by schools and associations because of their lower cost, the little effort required by top management, and "the ease with which such courses may be discontinued."

The reported prognosis for Chile is good, however. And at the conference Pres. Arturo Aldunate of Compania Chilena de Electricidad Ltda., was optimistic: "At least five of our universities now give training in management, and about 30%

* *Developing Better Managers, National Industrial Conference Board, 460 Park Avenue, New York 22, N. Y. 182 pages, $20 ($15 for associates of the NICB, educational institutions, and government agencies).*

DR. PAOLO ROGERS, ITALY: Private management has done a poor job in explaining its role in development.

TAIZO ISHIZAKA, JAPAN: Our training efforts are now moving ahead. College courses are on the increase.

SIR LESLIE ROWAN, BRITAIN: Too much attention to machines and factories, not enough to the managers.

of all our university graduates, with business students particularly in demand, are now going into work in other countries."

• **France**—Within the last six years, business administration departments have been established in all universities, but the present "wide and forceful" management development movement originated in courses run by various industrial and professional organizations in the 1930s.

Junior executives who attended courses, often at their own expense, sometimes became so enthusiastic that they succeeded in interesting their own companies in starting company training. But while most people have accepted the idea that management can be scientifically analyzed and studied, there is still a belief that "good men" are all that's needed to solve the problem.

• **Germany** — Systematic personnel development is followed by only a minority of companies with human relations considered the most important subject for all levels of management. Non-company courses are favored. There are at least 37 management institutions.

But the report concludes that "there is no sense in sending managers to any outside courses if there is no development program within the companies." It further notes that general courses as contrasted with specialized training may even be feared by top management. Companies claim they often make the "participants discontented with the state of their company and with their own managerial functions."

At the San Francisco meetings, Chmn. Dr. Hans C. Boden of Allgemeine Elektricitats-Gesellschaft (IM—June, p19) pointed to the widespread feeling in Germany that top management was itself responsible for everything. "We don't have middle management. And we don't have a widely developed profession of management consulting to help us toward a greater sense of professionalization. I do think, though, such a sense is developing."

• **Great Britain** — Nearly 7,000 persons are now taking the nationally organized course in management offered by 256 technical and commercial colleges. "Many firms would not engage anyone for a senior position who had not obtained his professional certificate." More than 70 other bodies also offer management development courses, including consultant firms and trade associations. Perhaps 500 companies have training, often with top management participating in the instruction.

Many companies, however, have little interest in managerial job descriptions, and rapid promotion of talented men often brings suspicions of favoritism or nepotism. There's also a tendency to reserve senior jobs for those with "the right class background."

• **India**—No universities grant a degree in business management, though four offer evening diploma courses. Most students "go on their own initiative and pay their own fees." Some of India's 16 management associations also offer training programs. But the prestige of management institutes is not high enough to appeal to senior executives, many of whom regard as an insult the idea that they or their social equals need training.

• **Italy** — Most companies are family affairs. Professional managers have few career possibilities —especially if the owning family is particularly prolific. Even in the more progressive companies, pressures and string-pulling are important. But best of all is "marrying the owner's daughter."

Larger companies feel forced to engage in more-or-less-formal management development, mainly because of the inadequate educational system. Illiteracy in the working population reaches 12%, and 85% don't go beyond elementary school. Fewer than 7,000 graduate each year with technical degrees from universities, and there's nothing comparable to business administration schools. A recent survey of management needs among state-controlled industries reveals that not one course listed by managers as "wanted" is included in university programs.

The average manager works harder and longer than most executives because he doesn't know how to delegate authority. He feels he must do everything himself, perhaps "sign hundreds of letters daily without even having time to read them." Thus, the biggest revolution that must be carried out is extend-

ing the concept of management, now restricted to a limited circle.

• **Japan**—Thanks to management training programs introduced during the U. S. occupation, almost 500,000 have taken in-industry training courses. The translation of U. S. books on the subject, and the exchange of U. S. and Japanese businessmen and management experts also spurred modern management development. But the long-established, big companies do not practice the modern ways they study, and the large number of small and medium-sized companies still cling to traditional practices.

Professional management and consultant organizations also provide many courses, as does one university. Most often, though, companies provide their own training, primarily for all managers rather than a few.

According to Chmn. Taizo Ishizaka of Tokyo Shibaura Electric Co., Ltd., the management education picture is changing rapidly, however. More college-level courses are being offered, seminars for top management are being developed, and the publication of business texts and magazines is increasing.

• **U. S. A.**—There's no question that U. S. companies practice management development. But such widely publicized methods as role playing, business games, and sensitivity training have been experimented with by only about 40% of the companies.

Reasons for the stress on management training include almost every trend characterizing current business practice—larger organizations, more complicated technologies, executives nearing retirement age, greater decentralization of authority with resulting job enlargement on the lower levels. But behind these trends may be cited increasing agreement on a general concept of management that distinguishes the activity as definably different from the business functions of finance, production, and sales.

Even more significant may be the fact that U. S. companies that are already well managed are the ones acknowledged to be most successful in manager development. "Good management is the company standard; improving the performance of managers is simply the way the company gets its best work done."

3. Comparing Unit Costs:

West Europe and Britain are lowest-cost areas; Latin America and Australia, highest. But world cost differences are narrowing.

Comparing the Costs

The figures below are based on the experience of 147 U.S. companies operating at home and abroad. Each supplied relative data on unit manufacturing cost and total unit cost of one or more products made in U.S. and foreign plants. The ratios of foreign to domestic costs are expressed in percent.

	Canada	United Kingdom	Common Market	Latin America	Australia	All Other	Total
MATERIAL							
Costs lower than U. S...	14%	23%	23%	14%	17%	15%	17%
Costs same as U. S.....	16	20	11	5	6	15	11
Costs higher than U. S..	70	57	66	81	78	69	71
LABOR							
Costs lower than U. S...	50	87	84	68	39	85	69
Costs same as U. S.....	18	3	5	5	11	8	8
Costs higher than U. S..	32	10	11	27	50	8	23
PLANT OVERHEAD							
Costs lower than U. S...	41	66	75	35	61	46	52
Costs same as U. S.....	11	3	5	6	..	8	6
Costs higher than U. S..	48	31	20	59	39	46	42
SUBTOTAL — MANUFACTURING UNIT COST							
Costs lower than U. S...	17	55	57	26	22	38	36
Costs same as U. S.....	15	18	8	8	6	..	10
Costs higher than U. S..	67	27	35	67	72	62	54
SELLING AND DISTRIBUTION							
Costs lower than U. S...	49	83	65	56	59	75	62
Costs same as U. S.....	18	3	7	9	6	..	9
Costs higher than U. S..	33	13	28	35	35	25	29
GENERAL AND ADMINISTRATIVE							
Costs lower than U. S...	36	73	65	30	24	25	44
Costs same as U. S.....	13	7	14	6	6	..	9
Costs higher than U. S..	51	20	21	65	71	75	47
TOTAL UNIT COST							
Costs lower than U. S...	20	74	64	31	21	42	42
Costs same as U. S.....	29	13	9	11	11	8	14
Costs higher than U. S..	51	13	27	58	68	50	44

American Experience Overseas

THE EXECUTIVES at San Francisco agreed that the shortage of qualified managers slows growth—of individual companies as well as of nations. They agreed too that even the most qualified manager is inhibited by a shortage of information on basic problems of business in an increasingly competitive world.

A matter of greatest concern has, paradoxically, little solid information that management can turn to. That is the complex business of international cost comparisons. Knowledge is limited. Where it does exist, it is usually filled with statistical traps (figures are seldom comparable) and sometimes with emotion (high-tariff advocates seize on wage cost comparisons to press their point).

I. Contribution

Yet research on international cost comparisons is going forward in Western Europe and the U.S.A. especially. The latest was undertaken in preparation for the International Industrial Conference in San Francisco.

Called *Costs and Competition: American Experience Abroad**, the new study is based on 249 separate sets of cost data for products made both in the U.S. and in foreign plants in 1960 and early 1961. Some 140 American manufacturers—of foods, chemicals, machinery, glass, rubber products, paper, and transport equipment—cooperated by supplying detailed unit cost data on operations at home and in a score of other nations.

The economists at the National Industrial Conference Board who prepared the study are quick to admit the statistical difficulties involved. Yet their 1961 study has the advantage of experience gained in the Conference Board's pioneer work on international costs in 1956 (IM—Feb.'59, p13). And one of the most interesting aspects of the present report is the comparison with five years ago. The Conference Board found:

"The net result of the many and diverse changes in manufacturing costs in the U.S.A. and abroad since 1956 appears to be a narrowing of world cost differentials. Products made at higher cost abroad have tended to become somewhat less expensive, and those cheaper to produce abroad have lost some of that advantage."

II. Summing Up

The report found no sweeping differences, and on the basis of a comparison of costs of a group of identical products it sees little change in the advantage or disadvantage of U.S. versus foreign manufacturing. Thus the study provides ammunition for those who have insisted that the U.S.A. has not "priced itself out of world markets" in the past few years.

The table at left provides a summary of the Americans' cost experience by area and by major cost factors. The study itself measures all these components in detail. To briefly note some of the findings:

Total Costs: In industrialized areas of the world, American firms manufacture at lower costs than at home; in less industrialized areas, higher costs are more prevalent. Greater material costs and smaller volumes are the major reasons for higher costs abroad; lower costs are due to labor savings.

Materials: Expenses for materials abroad exceed similar charges in the U.S. two times out of three. The greater size and maturity of the U.S. economy affords a "hidden productivity" factor in price and availability of both primary materials and intermediate products. Also some of the materials used by Americans abroad are imported.

Labor: Despite greater output per man-hour in the U.S., domestic manufacturers are seldom able to match the unit labor cost abroad. Still, the foreign wage advantage seldom comes through the production process into proportionately lower labor costs per unit, since productivity is almost invariably lower. The study notes, however, that the productivity gap is probably narrowing.

Selling: Expenses are uniformly lower. Lower salaries, more extensive use of distributors, and generally smaller promotion efforts account for much of the difference. But with the emergence of mass markets and the accompanying need for larger-scale distribution (as in Europe), the relatively greater experience of the U.S. companies may become a more telling factor.

Geography: Costs in the UK and the European Economic Community are notably lower—in all categories but materials. German costs are more frequently lower than in other EEC nations. Higher costs tend to be more prevalent in Canada. Latin America and Australia are decidedly high cost areas. Within Latin America, Mexican costs are nearer to U.S. levels; Brazilian and Argentine costs a great deal higher.

Scale: The plant volumes of U.S. subsidiaries abroad and their local competitors are usually smaller than corresponding domestic volumes. Their comparative costs tend to fall as volume increases relative to U.S. plant output. But excess capacity is greater in the U.S.A.; any fuller utilization of it would provide some offset to lower foreign costs.

Profit Margins: The Americans report that their profit margins tend to be somewhat greater abroad. Yet the unit costs and profit margins of local competitors appear to be similar to those of the U.S.-owned plants in a given country.

Disregarding differences in volume and other short-run factors, U.S. management believes its foreign unit costs will continue to be lower abroad than at home. But, says the Conference Board, cost does not seem the reason why Americans manufacture overseas: They do it either because of limitations on their exports or because it is found to be the best way to capitalize on foreign market potentials.

turn the page

**Studies in Business Economics #73, National Industrial Conference Board, 460 Park Avenue, New York 22, N. Y. 226 pages, $20 ($4 for educational institutions and government agencies).*

4. What Attracts Foreign Investment?

205 foreign investors emphasized these government policies...

- Firm adherence to a national development plan
- Favorable terms for transfer of profits and capital
- No discrimination against foreign ownership or control
- Equal treatment with domestic enterprises
- Freedom from burdensome government regulations

20 governments considered these their primary incentives...

- Tax relief offered to new foreign enterprises
- Equal treatment with domestic enterprises
- Progressive domestic business climate
- Transfer of profits and repatriation of capital
- Government-sponsored credit institutions

The two lists had only two incentives in common.

THE CONTINUING DEBATE about the role of private foreign investment in the world sometimes misses the basic point—why capital moves across national borders in the first place. So the sponsors of the San Francisco conference decided to go back to fundamentals, and see what they could learn about what attracts, and what repels, foreign investors.

The result is a study based on (1) 365 investment cases from 205 U. S., European, and Japanese companies; and (2) the ideas of 20 governments of capital-importing nations.*

• **Revelation**—Not the least of the study's revelations is the suggestion that the investing businessmen and the governments differ in what they regard as the major factors influencing the decision to invest. The table above contains what the two parties considered the five most important incentives a government could offer. The differences may be significant.

Many governments try to attract foreign investment by amending legislation and offering special privileges, by inviting and sending missions, by employing a variety of promotional techniques. These can be important. But the investors (and all the companies in the survey had made foreign investments in the past five years) emphasized above all incentives a nation's prospect for planned, orderly growth—and apparently were not much impressed by special government lures and promotional efforts.

• **Profit**—The study underlines an elementary fact—the investor first seeks an opportunity to earn a reasonable profit. And more than half the responding companies stated that the return must be higher than the investor can earn at home. Given this, the factor most frequently mentioned as prompting a new investment was the desire to expand or maintain sales by entering a new market—or preserving an existing market in the face of trade barriers. But an investment following imposition of trade barriers is not "automatic". The businessmen insisted that it would be made only if there is assurance of market growth.

Most large companies appear to have a foreign investment program to be implemented as opportunities arise. What attracts their attention? The factor most frequently mentioned was personal contacts made by company executives travelling abroad. And the most important factors outside the company that leads to investments are proposals from foreign industrialists. Management attaches the greatest importance to an appraisal from one who thinks about business opportunities much as he does.

The businessmen added that their interest may be stimulated by articles in the press and, to a lesser extent, by government trade missions, advertising, and the like. But the person-to-person contacts were deemed by far the most important.

One suggestion from the survey: Much more could be done with the device of the independent investment center in a capital-importing nation, working closely with government, to assist in making these contacts.

• **Deterrence**—What deters investment? In 85 cases where an investment had been considered but not undertaken, the main deterrent was political instability, followed by government limitations on ownership. Apart from these, the main economic reason was simply that return on capital seemed insufficient.

Summing up, the study found evidence that the over-all investment climate around the world has improved—at least for the companies responding to the survey questions. While both governments and businessmen should review their policies, there appears to be a better understanding on both sides of the purposes and operations of foreign investment. ●

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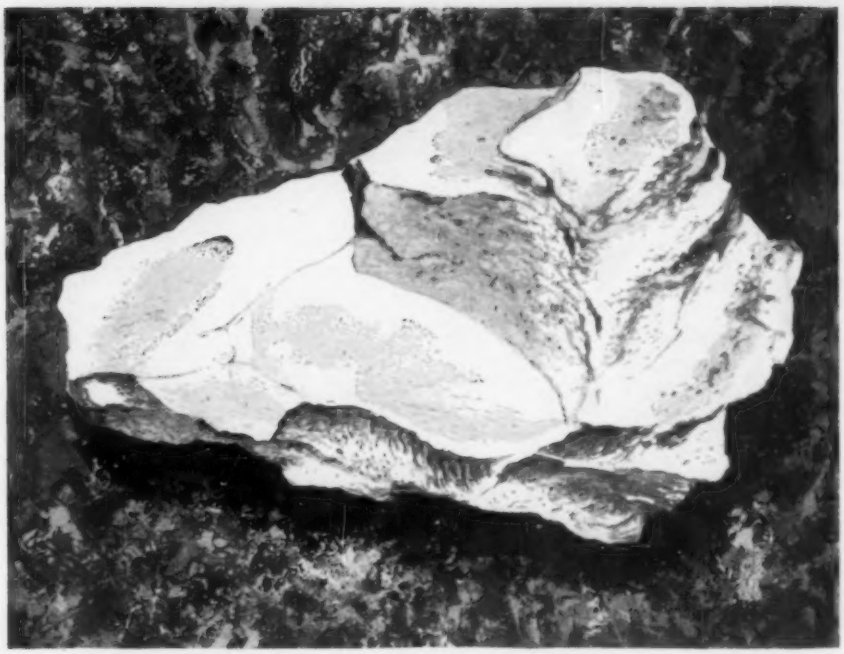
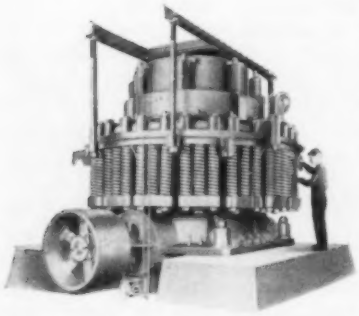
* *The Motivation and Flow of Private Foreign Investment, by H. J. Robinson. Stanford Research Institute, Menlo Park, California. 112 pages, $5.00.*



Dolomite

the "building blocks" of progress



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Breakthrough...

. . . is near at hand for electricity by direct conversion. New developments in the U.S.A.

NEW DEVELOPMENTS in the direct conversion of energy into electricity: In the U.S.A. early last month, the Electrochemical Society meeting was talking about fuel cells, the devices that convert the heat produced in a chemical reaction into electricity, and one investment adviser was calling direct conversion a "major technological breakthrough of this decade."

• **1000 hours**—The meeting received a report from two scientists of Ionics Inc. that the regenerative, membrane-type fuel cells should have a service life of 1000 hours or more. There was talk about isotope-assisted systems, using electrodes activated by radioactive isotopes to increase cell capacity; about high-temperature fuel cells which may operate on a wide range of fuel gases, including carbon monoxide or petroleum hydrocarbons.

Meanwhile, the U.S. Navy has announced plans to install a fuel cell power plant in diesel-powered submarines which may "rival the revolutionary capabilities of nuclear propulsion." And other researchers were working on a 200,000-watt cell. In these and other tests, efficiencies of over 60% have been achieved.

• **Fast pace**—Lionel D. Edie & Co., investment counselors, believes that the "breakthrough" is near at hand. Edie finds the pace of U.S. research speeding up, estimates that within two or three years $100-million or more will be invested annually in development of new power sources (of which fuel cells are but one example. IM—May). Current research and development spending is about $54-million, with private efforts amounting to nearly half.

What does all this mean to the electric utility industry? One American industry spokesman put it this way: "If a revolution is in the making, let the industry make that revolution or someone else will make it for us." ●

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Keeping Up

Mexican industry is growing—and fast. The Ruiz Galindos are setting the pace

Mauricio Ruiz Galindo—"With continuously expanding markets in office furniture in Mexico our future could not look brighter."

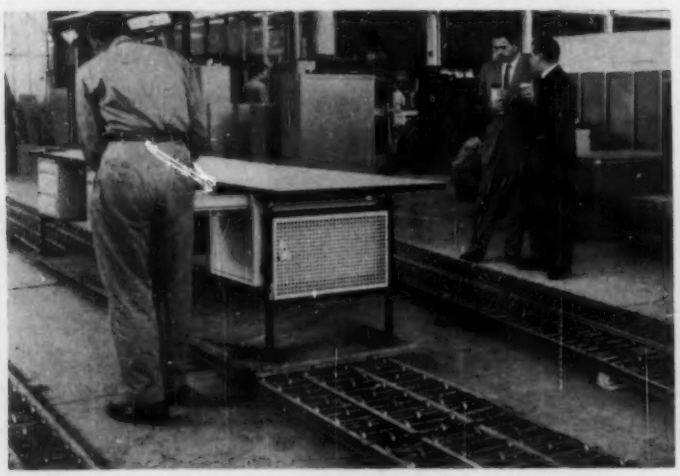
"Our low labor costs do not justify complete mechanization, but with the present trend towards higher wages this is changing fast."

JOIN INTERNATIONAL MANAGEMENT on a business visit to D.M. Nacional S.A., Mexico City. This family-owned business recently installed the first continuous production line in the steel office furniture industry in Mexico, and one of just a few in all Latin America. The new line has resulted in a 60% increase in production with approximately the same number of workers.

Mechanization of manufacturing has always been a problem in Latin America, and in other industrializing areas, because of the relatively small volume of production. But the steady expansion of the Mexican markets is bringing about a change.

Mauricio Ruiz Galindo, one of the three sons of the founder, is in charge of production. Thus he knows of the problems brought about by this change. In the pictures on these pages, he escorts a McGraw-Hill editor, Norman H. Solon of *Factory* on a tour of the plant. Here are Ruiz Galindo's comments on . . .

• **Machinery**—"Until recently, U.S. manufacturers were our sole suppliers, but during the past few years we have had to turn to Europe as a source of equipment. European suppliers are asking



"With this new moving line for desk assembly, productivity increased beyond expectations. Desk production increased by 60%."

"Our mechanics' school for employees' children shows the importance we give to their training."

With an Expanding Market in Mexico

30% less than their American counterparts for equipment of similar quality. Of course, U.S. deliveries take only 45 to 90 days, against eight to twelve months for English and German orders. But, except for emergencies, money talks."

• **Labor costs** — "Our salary scales are still lower than in Europe or the United States. But so is our cost of living. Our present union contracts call for salaries ranging from 2105 to 4280 pesos a month (roughly $175 to $356)."

Our belief is that the industrial future of Mexico depends on the standard of living achieved by the workers. Thus, working conditions and fringe benefits play an important role in our company. In addition to medical and maternal care required by government regulations, we provide lunches for workers, transportation to and from the plant, and mechanics' instruction for employees' children (14-15 years of age) on a volunteer basis. Also, if a worker becomes sick, a company doctor will visit him at home.

Housing on plant grounds is provided to employees selected by seniority and work record. Now 30 families live there. "Engineering scholarships are given anually to children of employees.

• **Automation**—"Our direct-labor costs are not high enough to justify heavy spending for automated equipment. We have mechanized our desk assembly and painting lines for product quality purposes only. But we have found that productivity increased beyond expectations too. As a result, in the future we expect to mechanize the final assembly line of all our wide range of products."

• **Incentives** — "A consulting firm in Mexico City set up time standards and now we have an incentive plan which is working fine. Contrary to many companies' policies, daily earings of each worker are posted on the bulletin board of the locker room. This promotes a competitive feeling, in addition to revealing the slackers."

• **Advancement** — "There is a definite line of promotions in our company. First, a worker serves a six-month period of apprenticeship, usually starting at the age of 16. After that he is promoted to helper. He then advances, according to ability, from third to first-class officer. Then to assistant foreman, and finally to foreman. All our foremen come up through the ranks."

• **Maintenance** — "We have hired a part-time outside engineering consultant, who shares the responsibility with the maintenance department supervisor. They report to the plant superintendent, who, in turn, reports to me.

"Preventive maintenance is stressed, especially lubrication and electrical equipment. This is the reason why outages have never been a serious problem with us.

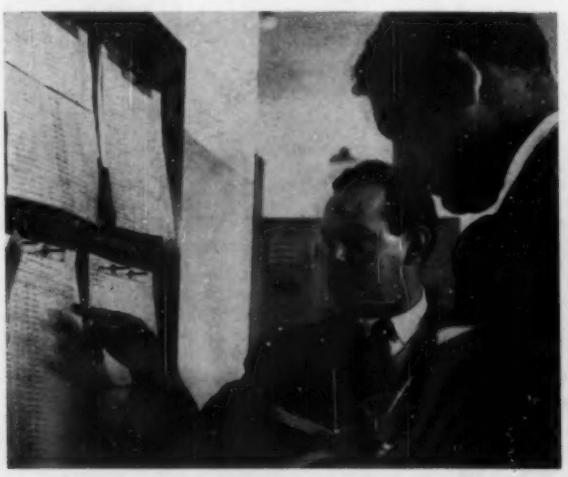
"Maintenance costs are reported monthly. There are also monthly downtime reports showing when each machine was out and giving the reasons why."

• **Housekeeping** — "This activity is completely separated from maintenance. Our 10-man janitorial force, which cleans the 11,000 sq. meters of the plant, reports to a house director. They start work a half hour before and leave a half hour later than production workers."

• **Competition**—"Mexican tariffs have discouraged most foreign manufacturers from invading our market with finished goods, thus, foreign competition is not a problem with us. Mexican imports are principally of capital equipment and machinery. This is where foreign producers are making money in Mexico today; not with finished products.

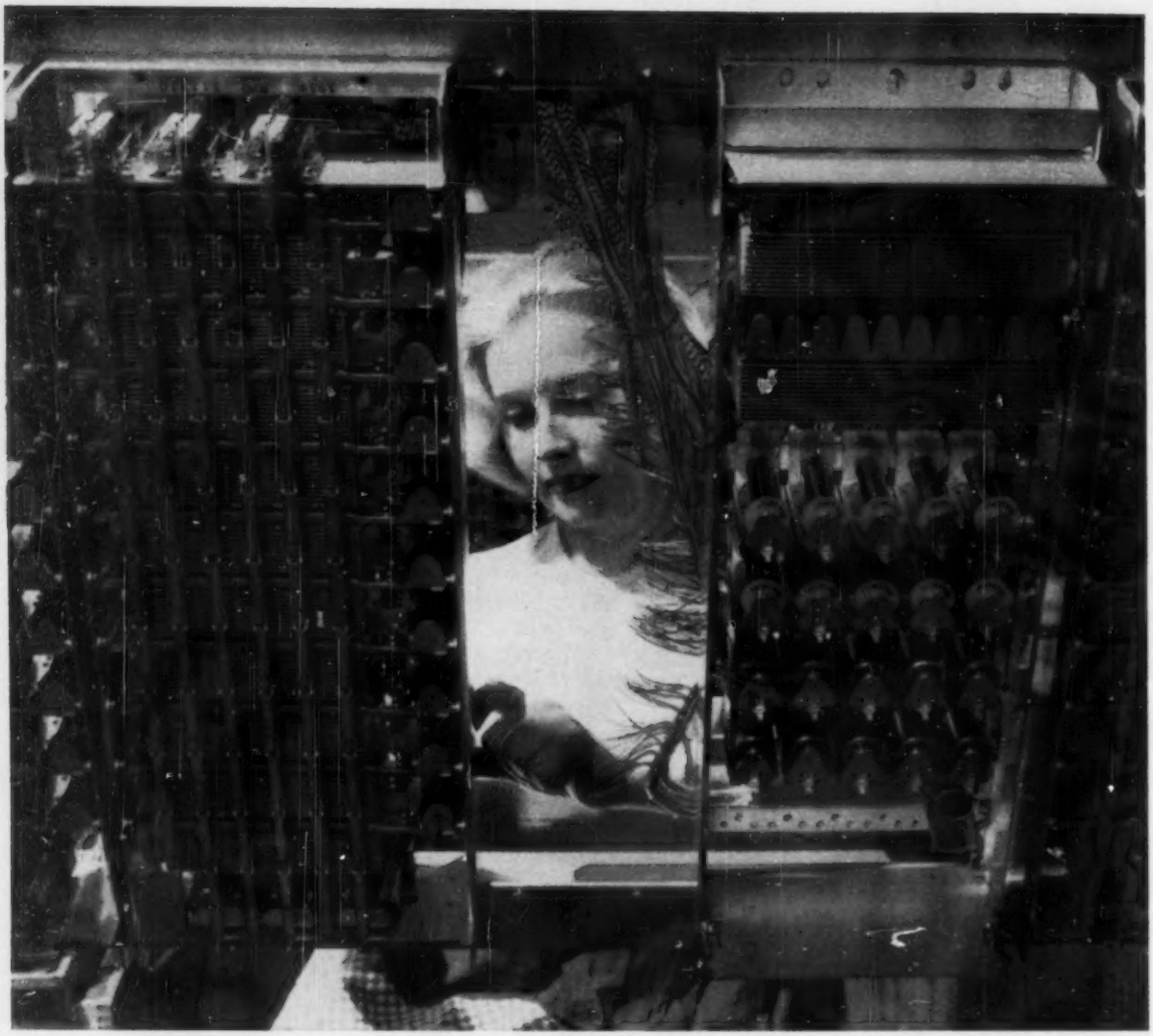
"But import restrictions are affecting us too. We used to have a substantial market for finished products in Central America. Now, with the development of the Central American Trade Agreement, those countries are also passing tariff laws to protect their own infant industries. We have been priced out of those markets.

"Now we are making test shipments to the United States. ●



"Incentives are new in Mexico. But we find them very effective. Most workers average 10 to 12% over base pay."

"Yes, this is the employees' cafeteria. We provide free hot lunches for everyone. We even have our own bakery."



A girl in a million

This Swedish blonde is framed by a million contact springs. Although we have only managed to get about 5000 into the picture, there are actually a million of these springs in the crossbar switches and relays which go to make up a medium-sized automatic telephone exchange. The smooth running of the entire exchange is dependent on the operation of each and every spring. Serious breakdowns in telephone traffic would result if just one spring failed its task. That is why reliability and long life have acquired such urgent importance for the L. M. Ericsson Telephone Company. But first-rate products require first-rate raw materials. Among the materials we supply is nickel-silver plate for contact springs. These springs must never tire and, in fact, they never do — a great number of them have to perform as many as 300 million contact operations during the service life of an exchange. If you place equally heavy demands on your products, perhaps we can help you, too.

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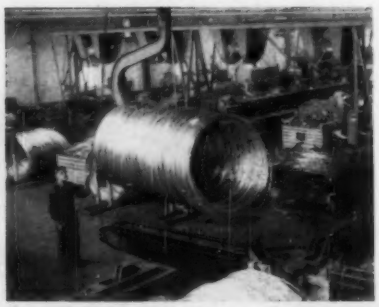

Svenska Metallverken for "Semis"

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Applications of punched card equipment in 1790 companies	Total using	Plan to study or being studied	Rejected because ..			Users have had these results . . .					
			Cost too high	Data volume too small	Other	Improved statistical reports	Lower costs	Improved accuracy	Faster customer service	Mostly satisfactory	Mostly unsatisfactory
Billing (Invoicing)	1195	264	58	65	8	101	108	145	137	137	5
Sales Analysis	1405	232	38	54	4	230	99	141	48	150	6
Inventory Control	1174	263	36	42	6	123	93	157	68	146	4
Accounts Receivable	1052	211	37	50	9	86	81	110	75	107	6
Payroll	1409	250	30	46	6	147	167	188	51	201	3
Accounts Payable	1018	170	33	45	5	90	84	96	43	111	5
General Ledger	872	165	23	37	8	70	63	84	18	85	5
Production Control	563	136	11	17		74	44	72	42	77	2
Cost Accounting	1034	180	17	23	3	132	93	125	32	122	2
Premium Accounting	303	64	12	17	2	25	27	27	19	34	2
Operations Research	269	49	29	36	57	37	22	29	16	34	1
Other:	607	138	17	17	2	101	82	99	70	98	2

Survey of applications shows that punched cards are still . . .

The Backbone of Data Processing

PUNCHED-CARD SYSTEMS are now most commonly used in accounting applications—payroll, billing, etc. —and for such uses as inventory control and sales analysis. As the chart above also demonstrates, whatever the application, some companies reject punched cards or find them "mostly unsatisfactory."

In fact, data-processing experts no longer like to generalize about punch cards. Application problems —payroll accounting, for instance —vary tremendously from company to company. And the possibilities of using punched-card systems have become almost unlimited.

• **World-wide**—In Switzerland, punched cards are used as telephone bills; in the U.S.A., as checks; in Sweden, as lottery tickets; in Japan, as loan repayment coupons; in Finland, pension records; in Brazil, credit cards.

When Britain's Thomas Cook & Son renders its travel account with France's Wagon Lits, the two companies simply exchange punched cards. Meter men for Britain's Eastern Gas Board record their readings on cards.

• **Review**—Punched cards are now so widely used that little is heard about the fundamentals of punched-card processing. For the thousands of businessmen who do not know much about punched cards, here is a review of the basic principles.

The idea is quite simple. By transferring information from documents of various sizes and shapes onto a card of one standard size, you can process the information by machine. The punched holes, of course, form a language that machines can understand.

In many applications today, the card itself is printed and used as if it were a conventional business form. Then the keypunch operator reads directly from the card itself when she punches in the holes. This time-saving procedure is especially suited for such applications as job costing, labor distribution, material requisition, billing, accounts payable.

• **Equipment**—To provide maximum flexibility when systems are being designed, punched card equipment has evolved away from all-purpose machines. While there are only three basic functions—punching, classifying, and tabulating-printing—there are several dozen specialized machines.

There are punching machines that work from numerals or from the alphabet; there is a machine for duplicating a set of cards, another for automatically punching repeated information. Price tags can be perforated to indicate size, color, style, etc., and this information can be automatically transferred to punched cards.

The basic classifying machine is a sorter, which segregates cards according to numerical or alphabetical sequences. There is another machine that sorts out duplicates, another that interfiles two decks of cards, etc.

Tabulator-printing machines add, subtract, and do very simple forms of multiplication. You can have an alphabetical tabulator, or a posting tabulator for accounts. You can get a tabulator that will produce summary cards from several detail cards.

• **Computer Stage**—A question frequently asked is when does a punched-card system graduate to a computer? There is a mistaken notion that these electronic data-processing machines are hooked into punched-card systems when complicated mathematics are involved. This is not the case. If a tabulator cannot handle your mathematical problems, you buy a punched-card calculating ma-

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chine, not an electronic computer.

A computer is called for when a punched-card system becomes cumbersome, as when work must be interrupted frequently to feed in more information. On a complicated billing job, you might have to make 20 "passes" on punched-card equipment to prepare customer statements. With a computer in harness, you could prepare the statements in one operation, in a fraction of the time. In other words, a computer contributes speed and simplicity.

• **Difference**—In the world today, there are still only four makers of punched card equipment—the U.S.A.'s International Business Machines Corp. (IBM) and Remington Rand Co., France's Companie des Machines Bull, and Britain's International Computing and Tabulating Ltd. (ICT). There is one basic difference in the equipment: Remington Rand's system is based on "90 column" cards —90 punches to the card—while the others use "80 column" cards.

The difference in the cards has little significance in terms of internal applications (the coding capacity of a card can be greatly extended by using holes in combination). There is a problem of compatibility, however, if punched cards are exchanged between companies. Also, some computers handle only 80-column cards.

• **Smaller Systems**—ICT has had a smaller 40-column system on the market for some years, and there are numerous installations of this smaller system in Britain. More recently, IBM introduced a miniature 80-column system. This equipment promised a breakthrough for the small firm—basic installations that would rent for $400 or so a month (as compared to perhaps $1500 a month for a minimum standard system). Because of mechanical problems, the IBM "3000" system has been withdrawn temporarily from the market. Shipments will resume as soon as redesign and retesting is completed, in 18 to 24 months. ●

Labor Trouble Grows...

. . . as management seeks to increase plant efficiency with new control techniques.

AS WAGES RISE, working conditions become a relatively more important factor in labor-management relations. Faced with higher wage costs, management must find ways of increasing efficiency. The most publicized solution is the installation of automatic, labor-saving machinery—automation. Less has been said about techniques that provide better control over workers and their working conditions.

Yet these methods can create labor problems just as delicate as those that come with automation.

• **Strikes** — Working conditions figured heavily in the months-long steel strike in the U. S. in 1959. Time off from the assembly line (to go to the men's room) was a major issue in U. S. auto industry labor problems a few weeks ago. A classic case of such labor trouble occurred in Milan last year, after a plant installed closed-circuit TV as an aid in determining time rates.

Management was tempted by the potential of the camera as a control device. But after several female workers—observed on the camera not working — were reprimanded, the women reacted with headaches, hysteria, and a strike.

Now comes a report from *Business Week* that two promising new management techniques in the U.S.A. are currently in conflict with trade union thinking.

Case I: Balancing Work Loads

Industrial scientists at the U.S.A.'s Armour Research Foundation have developed a formula that promises a 50% or more improvement in balancing work loads on assembly lines. Even in well-run plants, it should be noted, assembly-line delays waste about 5% of workers' time in radio and television receiver manufacture, 15% in home appliances, up to 30% in autos.

Armour's formula helps to arrange jobs so that every worker spends the same amount of time on the workpiece. One worker, for instance, might perform several simple tasks while another worker is busy with a single complicated task. To install this system, established sequences often have to be completely changed.

So far, Armour says, four customers have tried the system. In two cases, the labor situation is so delicate the companies refuse to admit they have tried the formula. Ford Motor Co. admits to trying it, but refuses to discuss its results. Bell & Howell Co., after trying the formula for a month on cameras, says it "looks encouraging."

Case 2: Monitoring Device

Several months ago, Cutler-Hammer, Inc., a maker of electrical equipment, installed an electronic device that monitors the production of 100 machines, at 36-second intervals. When a machine goes on "down time," a signal alerts the central control operator. The supervisor can then be directed to the machine; in turn he can report back to the central control.

There are a number of such monitoring systems coming onto the market. Cutler-Hammer installed Telecontrol, a device made by Hancock Telecontrol Corp. of New York.

Last month, Lodge 1061 of the International Assn. of Machinists—bargaining agent for Cutler-Hammer's 2,500 production workers—asked a federal judge to rule that installation of the monitoring device changed the conditions of work so vitally that it freed workers from their no-strike pledge.

• **Current Status** — Cutler-Hammer spent $37,000 to buy Telecontrol and another $27,000 to install it. The question now: How many companies are likely to invest in such devices if they risk labor trouble as a result?

The Telecontrol people say the device is not intended to control workers. Rather it provides management with "vital manufacturing data required to operate a plant more efficiently."

An official of the national AFL-CIO labor organization says that if workers can be convinced that this is management's aim in installing such devices, then there likely will be no problem. But if a company's workers believe the device will interfere with their own control over incentive systems or conditions of work, they are sure to object. ●

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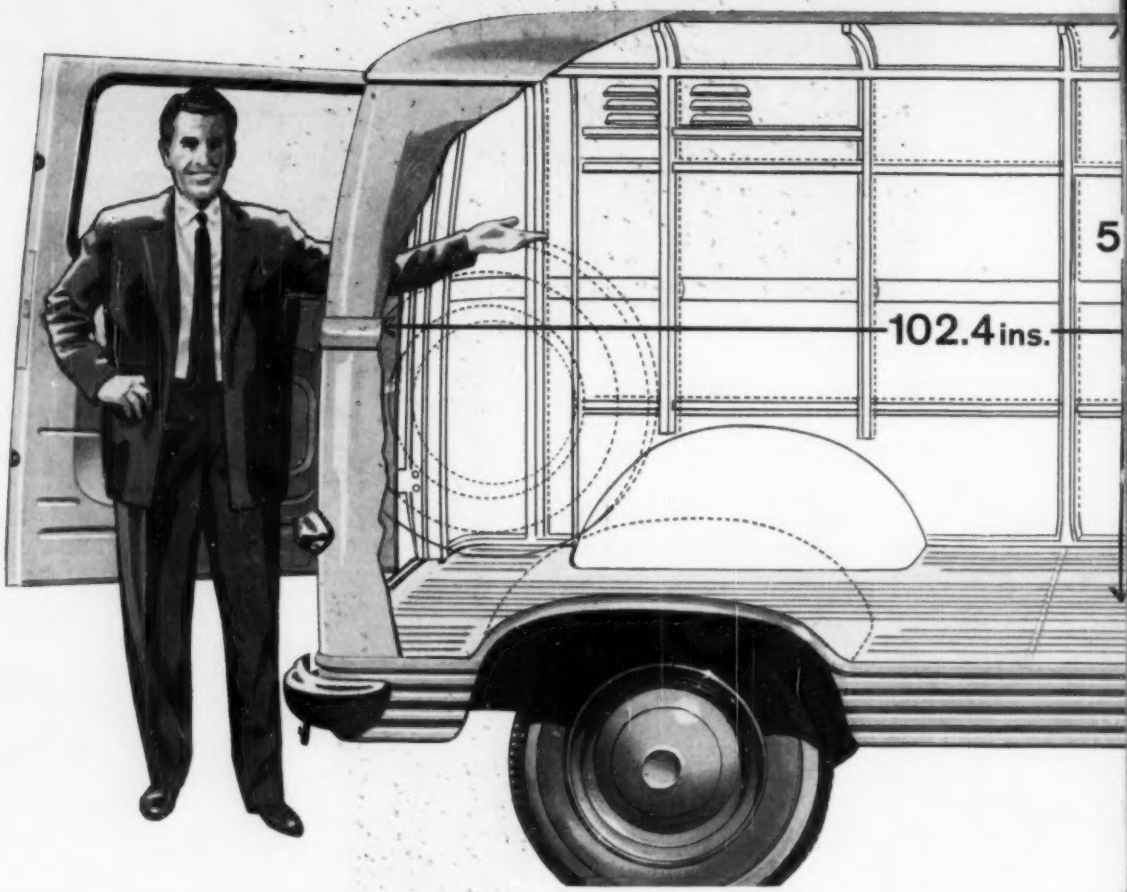

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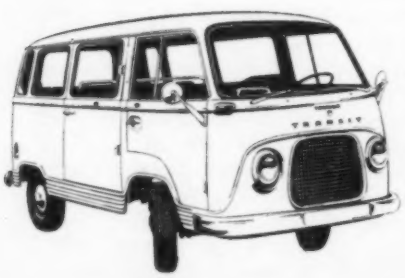
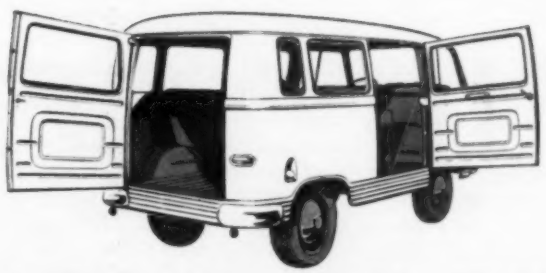
- Dependable rapid transportation. Powerful 60 HP (SAE) Taunus motor, fully synchronized 4-speed gearbox

Van	Engine	Gross vehicle weight	Payload	Cruising speed	Fuel consumption
Transit 1000	43 HP (SAE)	4630 lbs.	2205 lbs.	59 m.p.h.	32.5 miles/Imp. gal.
Transit 1000	60 HP (SAE)	4740 lbs.	2205 lbs.	62 m.p.h.	31.4 miles/Imp. gal.
Transit 1250	60 HP (SAE)	5291 lbs.	2756 lbs.	62 m.p.h.	30.7 miles/Imp. gal.

These specifications may vary according to national traffic standards

e doors · level load area





A complete line of quality commercial vehicles

Small Bus: An easily converted, all-purpose vehicle: a delivery van with 177 cu. ft. of loading space; a five seater with big loading area; an eight seater with plenty of luggage space in the rear.

Small Bus de Luxe: Comfortable 8-seat bus. Easy access to luggage space through the wide rear door. Also available as 9 or 10 seater.

"Little Giant": A super touring bus that carries up to 14 persons.

TAUNUS TRANSIT

from **FORD** of Germany

"Historically, management has concerned itself almost exclusively with production and has delegated the sales function to the wholesaler. Thus Egyptians [and businessmen in most developing nations] have little regard for marketing, and most marketing, until recently, was performed by foreigners."

A Drag on Economic Development

A TRADITIONAL DISREGARD for marketing, common in many developing nations, is now being challenged. The quotation above comes from an article entitled "Egypt's Need for Marketing Management," in a recent issue of *Business Horizons*, published by Indiana University in the U. S. A.

The need for a different kind of revolution—a marketing revolution—holds for all of the developing nations. Compelling arguments come from two professors at Cairo University, Abdel Aziz el Sherbini and Ahmed Fouad Sherif, in collaboration with Harper W. Boyd, Jr., a U. S. marketing professor.

• **Reverse**—It has typically been thought that the marketing concept is more important to a mature industrialized country than to one with a developing economy—the old argument of a "seller's" versus a "buyer's" market. It is the contention of the authors that just the reverse is true. Why? "Because most underdeveloped countries that are attempting to industrialize can ill afford to have a major breach between the needs of the consumer and the country's industrial plant."

The process of industrialization, the authors argue, is actually product development on a large scale—determining what to produce, planning plant capacity, organizing distribution channels. Since few Egyptian firms recognize their responsibility to be customer oriented, however, "scarce resources are not used properly—a waste that Egypt can ill afford."

• **Production Bias**—Most of the larger Egyptian companies have sales departments with the sales manager active chiefly as a contact with wholesalers. Some companies have "commercial" departments, which combine the functions of purchasing, sales, and inventory activities. In either case, the sales or commercial manager is usually below the production manager in authority and influence. And rarely is a sales manager able to climb upward in management.

When new enterprises are formed, the starting management team typically does not include a sales manager, let alone a professional marketing man. With production men in the saddle, little attention is paid to sales forecasting. "As a consequence," say the authors, "many new enterprises have been set up with a production capacity far in excess of the needs of the market." And without sales forecasting, production scheduling continues to be a problem.

• **Research Lags**—In almost no case is product research thought of as a continuing management responsibility, the authors state. Product development is the exclusive province of production management, and there is much imitating of foreign products. This "tends to divorce product design and development from the needs of the local market."

In addition, there is practically no "feedback" of information through the distribution channels. There are no research institutes studying the consumer; only a handful of companies have ever undertaken marketing research. Yet where products have been adapted to the local market, increased sales have resulted. The authors cite a low-priced refrigerator, a small stove for making Arabic coffee, and inexpensive, ready-made shirts.

• **Sheltered Markets** — Most Egyptian firms are protected from foreign competition by import restrictions and high tariffs. The government's intentions are understandable. But as one consequence, management is relieved from market pressure for product improvement.

Lack of uniform quality is a serious drag on an underdeveloped economy, the authors say. It makes branding difficult; it makes exporting equally difficult.

• **Lack of Selling**—Aside from one or two petroleum firms and a few insurance companies, Egyptian companies do not go in for sales training. And "little if any attention is paid to establishing territories, setting quotas, and routing salesmen," the authors say.

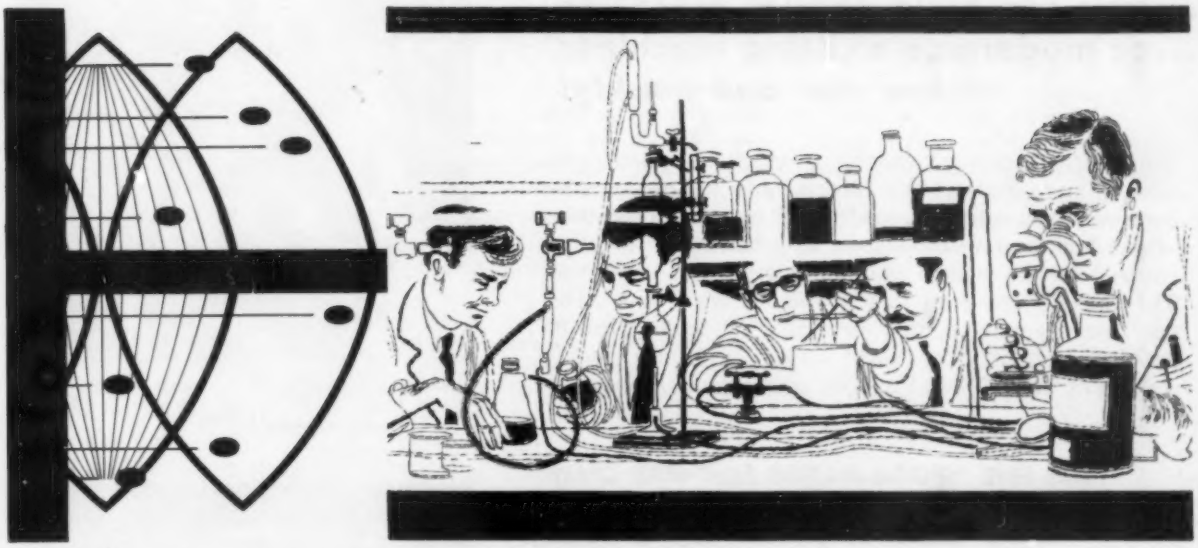
To be sure, there are good reasons for a company not to spend heavily on sales promotion and advertising. There is fear that wholesalers might retaliate if "pushed" into carrying a given product. Impulse buying is not very great; many products are sold unpackaged; there is a lack of media suitable for national advertising.

Equally to the point, however, Egyptian businessmen assume demand to be fixed—though there is plenty of evidence to the contrary. According to the authors, the businessmen have "no concept of demand manipulation through the use of such strategies as advertising, personal selling, price, product and product line, and channels of distribution."

In such a noncompetitive economy, businessmen do not take naturally to the marketing concept. And getting management to change its attitudes will not be easy. But somehow, the authors insist, a marketing revolution must come to the developing nations. Otherwise, growth will be difficult to sustain. ●

searchers in this 'tron world

Philips researchers are from many nations. They work together in laboratories all over the world... a 'tron world increasingly dependent on the advancement of electronic science. Many are prominent specialists in nuclear energy, telecommunication, light, sight, sound, health and a hundred more fields of endeavour. They are scientists and students and their common aim is to progress beyond the frontiers of present-day knowledge for the ultimate benefit of man. Each day they challenge the unchallenged idea, and develop it into tangibility with new techniques and vast resources. Research, its encouragement and appreciation, has always been fundamental in Philips' own development... from a humble lampworks 70 years ago to the international World Federation of Industries it is today.



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Philips aim towards stability now and security for the future - as is witnessed by their wide scope of products and their world-embracing activities.

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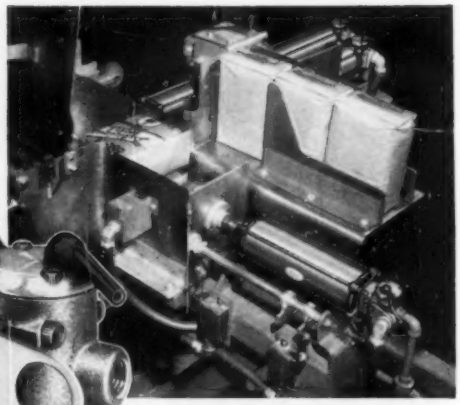
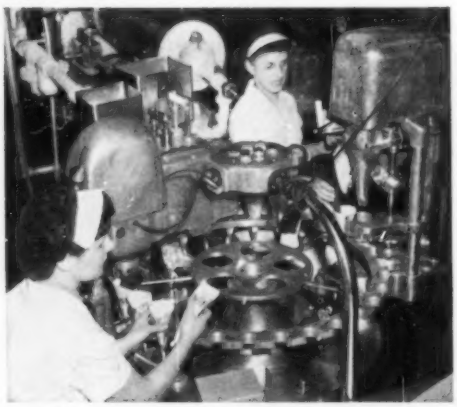


Packaging coffee is simplified by this Bellows Air Motor powered equipment.

...you can build special machines ...or modernize existing machines *at low cost and quickly!*

With parts normally available in every tool room, plus one or more Bellows Air Motors, and a little creative ingenuity, you can "spot modernize" scores of operations whose high cost whittles away at profits. The few illustrated here are typical of hundreds we can show you. The chances are good that no matter what you make, nor how you make it, this versatile air cylinder, with its *built-in* electrically controlled valve, can lend a mighty important helping hand to your cost reduction program.



Bellows Air Motors fill ice cream, add nuts and fudge, fold and seal the wrapper in this special machine.

THIS FREE "SPOT-A-MATION FILE" MAY SPARK AN IDEA IN YOUR MIND THAT CAN MEAN IMPORTANT COST SAVINGS

A note on your letterhead will bring you basic data: wiring diagrams, installation details, equipment list, on a score of "everyday" operations almost every industry uses. Address Dept. IMD-1061, Bellows-Valvair, Division of IBEC, S.A., 25 Route Des Acacias, Geneva, Switzerland. In Great Britain and the Sterling area: Bellows-Valvair Ltd., Edgemond Avenue, Tyburn, Birmingham 24, England.

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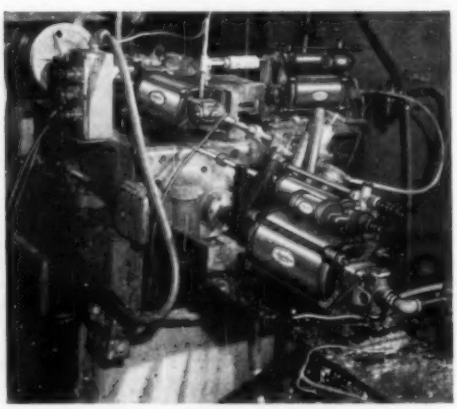

Tail stock, tool bit, and cross-slide are moved by Bellows Air Motors in this lathe conversion.

Bellows-Valvair

Bellows-Valvair, Division of IBEC, S.A., Geneva, Switzerland
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Sales Training for the "Little Man"

The U.S.A.'s plumbing contractors found the answer to "cashing in" on a new market—better selling.

THERE ARE thousands of small plumbing contractors in the U.S.A. who, until a few years ago, went about their business oblivious to the need for any kind of real sales effort. Business came to them naturally, in the nature of a tradesman's relations to his community. Their outlook, in fact, was similar to that of production-minded small businessmen everywhere.

Then they became aware of a promising source of new business—the home-improvement and house-remodeling market. The contractors considered themselves logical candidates to capture a large slice of this business. They were experts in installing kitchen equipment, for instance; they understood the technical mysteries of heating and cooling equipment. In a word, they had products to sell along with their service, and vice versa.

But only a small part of this business came their way naturally. They might be called in on big plumbing jobs, but they did not sell enough of the equipment—especially auxiliary equipment such as garbage disposal units—that could make a big difference in their "take-home" profit.

In competition with their expertise, the big retail establishments offered equipment at lower prices that did not require any great engineering skill to install. The "do-it-yourself" trend was also working against the plumbing-heating-cooling contractors. But overshadowing these obstacles was the fact that contractors did not have the sales ability to fight the trend, or to take any business away from chain stores and discount houses.

• **Self-Help Plan**—Sales training was a crying need in this industry. A turning point finally came in 1959, when the contractors' trade association formed a sales training council.

The council's first step was to find out the specific problems and needs of the industry. A relatively small and typical town, Dubuque, Iowa, was selected as a laboratory to develop a sales training program. One reason the city was chosen: Dubuque's two plumbing supply wholesalers, whose business depended on the contractors, offered their enthusiastic cooperation in working up a program.

The next step was to work out a training course. Help in putting on trial sessions came from the University of Wisconsin's Business Institute. When the subject matter was decided upon, a professional sales-training organization was called in to put the final touches to a sales-training "script." The result was a series of 10 training sessions, each lasting three hours.

• **Grass Roots Movement**—With the program on paper, the council set up a Sales Development Institute at association headquarters in Chicago. The Institute's director was given the task of organizing a "grass roots" movement according to a strategy outlined by the sales training council: Concentrate on training a corps of volunteer instructors, who in turn would teach thousands of contractors in their home areas.

Since December, 1959, 26 classes for instructors—lasting one week each—have been held in various parts of the country. "Teaching certificates" have been awarded to 265 men, who in turn have held courses for 2,000 contractors in the fundamentals of selling.

Support for the program has come from manufacturers and wholesalers who supply the industry. One manufacturer has sent 30 representatives to instructor classes; one large wholesale house can boast of 41 qualified instructors.

Also, the sales training course has been added to the adult education programs in several cities. And two qualified instructors are attached to the extension division of one midwest university.

• **Praise**—*Industrial Marketing* magazine recently described the program as "one of the most progressive, industry-wide, self-help marketing courses that is currently being offered."

The training classes are tied so close to actual sales problems that "homework" assignments can be worked in the day-to-day conduct of a contractor's business. After three sessions of a recent course in San Francisco, the 30-man class traced $9,500 in extra sales to ideas discussed in the course.

One "graduate" of a sales training course told *Industrial Marketing*: "Any contractor who takes the selling fundamentals program and does not increase his gross sales at least 25% in the next year should not be in the business." ●

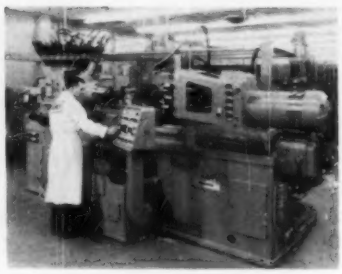
What the contractors learn—in 10 sessions, each lasting three hours

1. How to talk the customer's language. Stressing the benefits of the product rather than the features.
2. How to upgrade the quality of the product and how to add on other related products for a bigger sale and more satisfactory installation.
3. How to coach journeymen (installation men) to spot and report new sales possibilities on every job.
4. How to keep systematic records of these possibilities to have them always available.
5. How to develop an identification program that directs buyers to you.
6. How to use direct mail to create additional business.
7. How to use advertising effectively tailored to the individual firm.
8. How to meet and overcome customer objections during a sale.
9. How to close a sale.
10. How to use time-payment selling as a sales tool to create more business.

European Machine Tools

The European Machine Tool Exhibition, which came to Brussel's Palais du Centenaire early in September, outdid any of its predecessors in size, quality, and tool sophistication.

Among the 4,000 machines on display—compared to the 2,500 in 1953, when the show was last held in Belgium—was the tape-controlled Burkhardt & Weber-Hughes Aircraft (West Germany) complex "machining center" shown above. This is a three-way machine with drilling, boring, and milling heads, and automatic tool change in three seconds. Its rotary table has coordinate positioning in three axes.



Another West German tool featured at the Pailais was the Heinemann Komplemat 225, a multi-purpose machine that can be assembled from building-block units as a copying, multi-tool, or turret lathe. The filling of the base of the Komplemat 225 is prestressed concrete, a rare material at a machine tool show. The concrete, gives the machine the rigidity needed for ceramic tooling.

British machine-tool makers were well represented at Brussels, reflecting that country's bid for membership in the Common Market. On display were a Churchill Gear Machines Ltd. 10 in. hard gear finisher, an addition to this company's line of gear producing machinery; a Contimatic 1520 precision miller and borer, by Newell Engineering Co. Ltd., fitted with A.E.I. Numeritol magnetic-tape control; a Wadkins Ltd. rotary miller, designed for continuous use on auto production lines.

Fuel cell for the home

A small fuel cell that could "supply all the electricity for the average home", as well as cool or heat the house, is being developed by Illinois Institute of Technology for the U.S. natural-gas industry. The cell feeds natural gas and steam to one electrode and air and carbon dioxide to the other, and operates at a temperature of 800 to 850 C.

Lignin rubber

Canadian scientists have been replacing carbon black with wood-derived lignin and ending up with vehicle tires that use less rubber, are more independent of strategic materials, and appear to wear as well as conventional tires. The lignin tires, under study jointly by the Canadian Army and the Canadian National Research Council, show less resistance to cutting and chunking, but scientists believe that these properties can be improved.

Lignin's future as a replacement for the more-expensive carbon black, however, will depend on the solution of processing problems. Carbon black is easily dry-milled into the rubber stock with existing machinery, but lignin must be blended with latex in an aqueous solution, then coprecipitated with sulfuric acid. The present research program is aimed at developing military tires that are not dependent on strategic materials; the possibilities for commercial lignin tires are still remote.

Pneumatic powder mixer

A powder-mixing machine developed by William Gardner & Sons Ltd., Gloucester, England, uses compressed air in place of blades or agitators. A mixing head at the base of a vertical cylinder feeds the compressed air through nozzles in one- to two-second blasts, setting the powder in a spiral motion. Working capacities of the machine range from .06 to 22 cubic meters, and the mixer can be modified to accomodate liquids in addition to powders.

Super-powerful magnet

A fist-size, 450-gram magnet developed by U.S.A.'s Westinghouse Electric Corp. is said to have twice the power of a conventional 20-ton unit, and to require only a tiny fraction of the electric power. The device, consisting of a coil of niobium-zirconium wire operating at extremely low temperatures, is expected to be a major aid in the development of new methods of generating electricity and in making improved rocket motors for space travel.

Electric current breaks rocks

General Electric Co. of the U. S. has developed an electrical method of rock-breaking that can be used by mining companies instead of explosives for secondary breaking of rocks. The method uses a radio frequency power generator to force a current-conducting path through the rock, which it does by seeking out small amounts of water trapped in the rock. Then a second kind of electrical energy—direct current—is applied to the rock. This heats the rock so intensely that it splits along the already formed paths. GE claims the system is safer and speedier than the use of explosives. And once the initial costs of installation are covered (the necessary equipment would cost "less than $60,000"), it will operate five times more economically than explosives.

Fluorosilicones

A new line of fluorosilicone fluids, greases and compounds are being marketed by Dow Corning Corp., Midland, Mich., U.S.A., supplementing the fluorosilicone rubber introduced by the company five years ago. The new semi-organic materials have many of the characteristics of the silicones, but they also have exceptional resistance to solvents, fuels, and chemicals. Initial production will be going into aerospace operations, as an additive to special lubricants, a base for greases, a defoaming agent.

Pressureless printing

A new method of pressureless printing, developed by Stanford Research Institute, Menlo Park, Calif., U.S.A., uses an electrostatic effect—opposing electrical charges—to transfer ink to a wide variety of surfaces, ranging from newsprint to such objects as bottles, aspirin tablets, eggs, corrugated paper. Victor Barta, SRI laboratory manager, predicts that an electrostatic printer will cost only half as much as a conventional printer and offer better control of the printing process.

(Advertisement)

Mr. Bruce: *(right)* Pan Am Jets certainly make business travel a pleasure—we must be going 600 miles an hour.
Herr Mueller: *(left)* It's good business to ship *products* by Pan Am Jet, too.

B: I suppose so, but I always thought air cargo was for small, light items.
M: Not at all. We've shipped 5 tons on one of these Jet Clippers. It's carried below, in special compartments.

Mr. Bruce meets Herr Mueller and discovers *products* can move as as fast as *people*!

B: Really? But isn't that expensive?
M: Pan Am Clipper Cargo can *reduce* shipping costs. In fact, some rates have been reduced as much as 63%. ***And*** you save on warehousing, damages and crating.

B: Our company manufactures heavy machinery. Shouldn't that go by "surface" all the way?
M: Not necessarily.
B: You mean we could ship 10-ton machines by air?

M: Why not? Pan Am has giant all-cargo planes, too. Bigger than 2 freight cars inside. Your machinery could be delivered, installed and in operation in a couple of days—earning money for your customer.

B: Sounds good. I'll call Clipper Cargo when I get home.

Save time, trouble and money on your overseas shipments. Call your Cargo Agent or your Pan Am office. Clipper, Trade-Mark, Reg. U. S. Pat. Off.

Miniature gage

A gage no larger than a thimble, which can be attached to motors, turbines and other equipment to record service time at specific temperatures, is available from Ilikon Corp., Natick, Mass., U.S.A. The gage is made of a bundle of fine wires held in an electrically insulated frame. The composition of the wires is such that their electrical resistance changes with time and temperature. This change records the thermal history of the machine the gage is attached to. No outside connections are required.

New epoxy resins

Two U. S. companies have announced new series of epoxide resins. Koppers Co. Inc. of Pittsburgh is producing resins which it claims allow more cross linking, have improved thermal stability, and high resistance. The second company, Furane Plastics Inc. in Los Angeles, has a series of transparent rigid and semirigid epoxies capable of curing at room temperature. Suitable uses: transparent glazing for aircraft and missiles; potting and encapsulating materials for electrical applications.

Plastic coatings for pipes

Plastics are making fast headway as outer and inner coatings for pipes. In the U. S., external plastic coatings on steel, such as Republic Steel Corp.'s X-Try-Coat, are replacing conventional coatings of coal tar or asphalt wrapped in felt. Republic's coating weighs about 80% less and needs less care than the conventional wrappings. Cathodic protection for plastic-coated pipe offers another saving; One company estimates the cost for cathodic protection of a 48-Km stretch of pipe at 75% less than wrapped pipe. Interior coatings for pipes—to eliminate corrosion and speed the liquid or gas flow—are fairly common in the oil industry, where they are used chiefly for downhole pipe and for diameters of 3.75 to 10 cm. They are also finding uses in certain applications in the chemical and food processing industries. Steel companies in the U. S. are looking for a process to apply the coating on the inside of the pipe on a volume basis. At the moment, Republic Steel Corp. is the only producer that makes the pipe and coats it (externally), although Jones & Laughlin Steel Corp. has announced a vinyl coating not yet in production.

For faster laundering

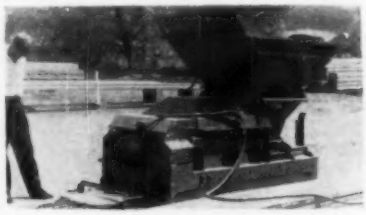
A new commercial laundering machine has been designed to process flatwork at up to 15 times the production rate of present equipment, at 30% less cost. The automated machine, manufactured by Jet Stream Products Inc. of Dallas, Texas, U.S.A., launders pieces through the cycle of washing, rinsing, drying, and ironing at 50-75 cm/sec. A conveyor belt system eliminates manual handling.

Coat it yourself

A do-it-yourself version of the nonstick (TFE-coated) frying pans developed in Europe and the U. S. now is being encouraged by American Machine & Foundry Co., New York. AMF's new home products division is marketing an aerosol that dispenses a "miracle coating" which, after baking for 45 minutes, allows pans to be used without fats or grease, and to last for 30 to 90 washings.

Under-floor heater

Netherlands Apparatus Factory (NIFA), Amsterdam, is marketing a hot-air heater that is mounted under the floor and is recommended for small spaces such as dressing rooms, builders' sheds, ship's wheelhouses. The heater, about 35 cm square and 18 cm high, burns butane or propane in three rows of short aluminum tubes. A walkover grid placed flush with the floor permits walking on the heater while it is burning. The heater has been approved by the Gas-Institute, The Hague, and by the Gaswarme-Institut of Essen, West Germany.



On-site prestressed planks

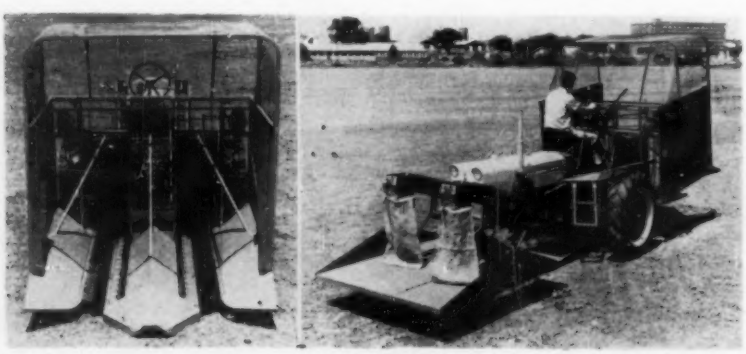
The electrically powered Dodd extruder shown above, manufactured by Leap Associates, Inc., Lakeland, Florida, U.S.A., turns out 335 square meters of prestressed concrete planks in an 8-hour day—and is said to save contractors up to 50% in labor costs. The machine guides itself along the prestressing strands, and therefore does not require rails or special forms. It can produce roof and floor planks two-thirds of a meter wide, 5 to 10 cm thick, with square, V-shaped, or tongue-and-grooved edges.

Low-cost free-piston engine

A Canadian inventor has developed a free-piston engine which he says is "cheaper—even in small sizes—than a diesel and less expensive to operate." Prototype models are in the 80-hp size, and have a weight/power ratio of about 2.5 kilos per gas hp. Patents for the engine are held by Free Piston Development Co., Kingston, Ontario, Canada.

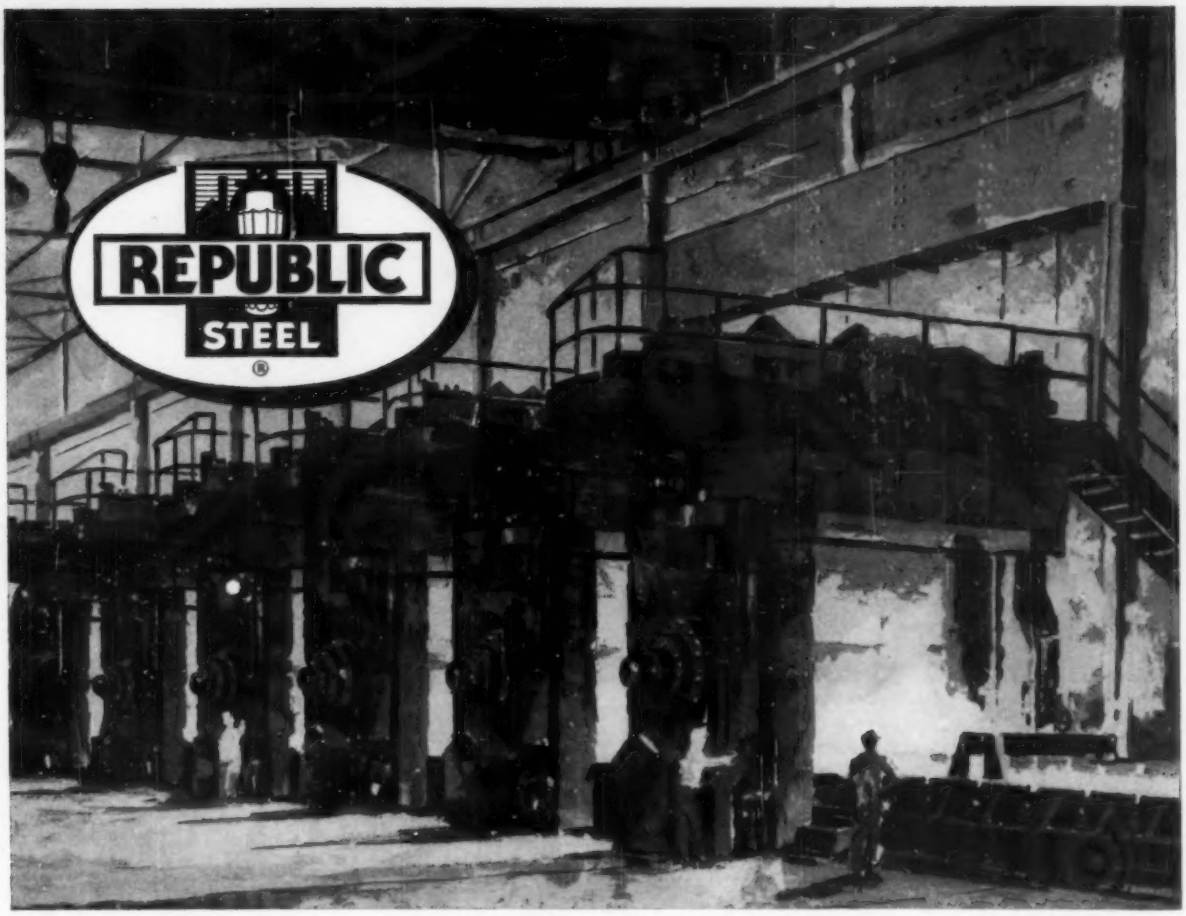
Versatile can maker

U. S. design engineers appear to have solved one of the serious problems of can makers: how to adapt production equipment to the various materials—from thin tinplate to aluminum—that customers want. Researchers at American Can Co have produced a new all-purpose machine that turns out cans of any material at the rate of 2,000 a minute—three times as fast as a conventional machine. Strip metal is first formed into a tube, and then cut to length.



New bean harvester

This harvester for castor beans, developed by the U. S. Dept. of Agriculture, is not only faster than handpicking (the only method available up to now) but also results in less damage to the beans. The plants pass between two sets of brushes (see picture), and a beater underneath the unit removes the beans. Then an auger conveys them back to the sacking device. The USDA says the machine will harvest a plot two rows wide and 6 meters long in about a minute and a half. Manual harvesting would take at least 45 minutes.



The mark of leadership in steel...

This new, modern 56 inch strip mill in midwestern America is a good example. For many years, Republic has enjoyed a worldwide reputation for producing highest quality flat rolled steel—carbon, alloy, and stainless up to 90 inches wide. This new facility is typical of Republic Steel's planning for *tomorrow's needs* as well as today's.

Republic is known the world over for major advances in steels and steel products. That's because much time, money, and effort are devoted to research... to the addition of modern production facilities... to the improvement of existing facilities... and to the installation of latest quality control equipment.

With qualified sales representation in all parts of the world, Republic offers quality steels and steel products, plus complete steel service.

YOU CAN PROFIT BY USING THESE REPUBLIC STEEL PRODUCTS

STAINLESS STEEL
(Sheets, Strip, Bars, Tubing, Wire, Bolts and Nuts)

Resists rust, corrosion and high temperature. Can be polished to a beautiful, lasting luster. Sanitary. Easy to clean.

HOT AND COLD ROLLED SHEETS

Carbon, Alloy and Stainless Steels. In widths up to 90 inches. Uniform in fine surface, and in fabricating qualities.

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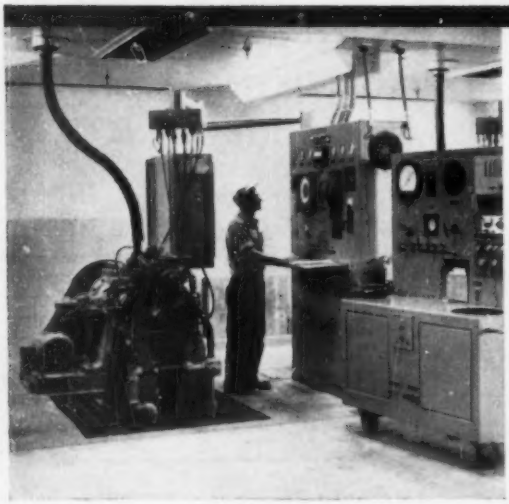
REPRESENTATIVES IN PRINCIPAL CITIES OF THE WORLD

NEWS AND VIEWS OF THE WORLD AT WORK



Quality is built into every engine, then checked and rechecked under the strict scrutiny of modern testing devices. Lights, dials and gauges register each heartbeat—an engine *has* to be good to pass.

At Cia. Peruana de Cemento Portland, Lima, Peru, four Allis-Chalmers kilns produce over 900 tons of cement per day. This company bought its first Allis-Chalmers kiln over 35 years ago and it is still in use. Based on the outstanding performance of this first unit, Peruana has added three new Allis-Chalmers kilns during the past ten years. This cement operation is just one of many applications where auxiliary power by Allis-Chalmers engines plays an important part in smooth, dependable production.

Allis-Chalmers International, Milwaukee 1, U.S.A.

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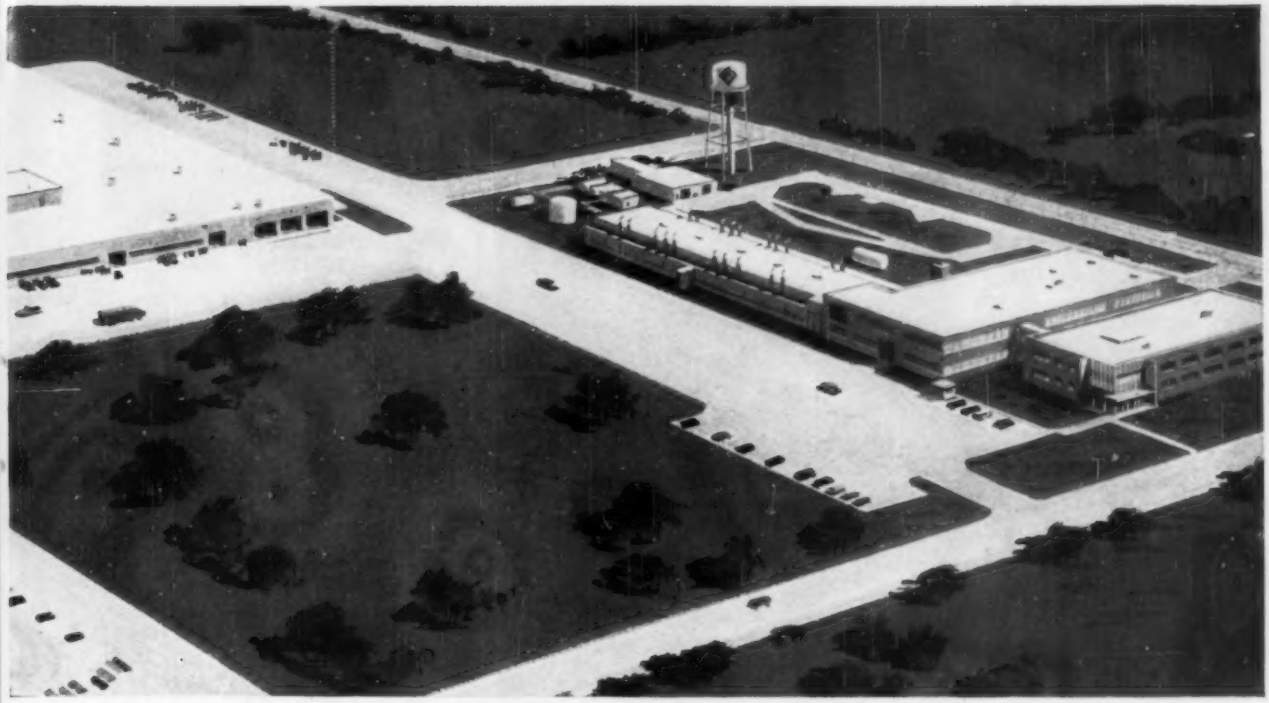
Serving the world in **MANUFACTURING • ELECTRIC POWER • CONSTRUCTION**



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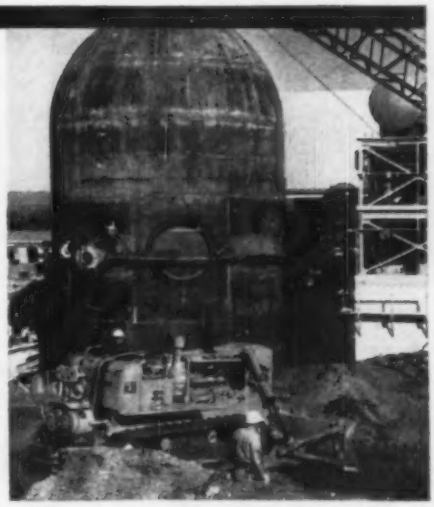
The Pathfinder Atomic Power Plant has Allis-Chalmers as its prime contractor. This plant, when completed, will furnish enough electricity to serve a city of 130,000 people. In the foreground, an Allis-Chalmers diesel engine powers the HD-16 crawler tractor on backfilling and grading work around the Pathfinder's reactor containment shell. Today, earth-moving work on hundreds of large and small projects around the world are under way with Allis-Chalmers powered construction equipment.



Allis-Chalmers manufacturing subsidiaries in England, France, Italy, Australia, Mexico, and distributors, licensees and representatives throughout the world, assure you top-quality machinery and service.

MINING • AGRICULTURE • PUBLIC WORKS • NUCLEAR POWER • BASIC RESEARCH

WORLD
YALE & TOWNE
REPORT

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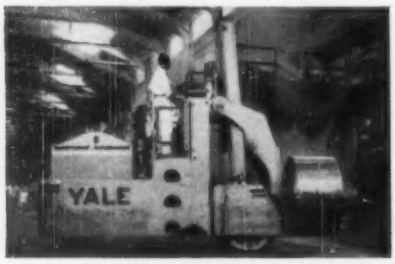
SUNDERLAND, England – Always present in the glass industry is the danger of breakage during handling and storage. For this reason a major glass dinnerware producer in England has chosen the Yale fork lift Worksaver in warehouse storing. The smooth operation of these trucks assures handling the dinnerware loads gently; their compactness makes them ideal for congested storage areas. Yale fork lift Worksavers are available in capacities up to 7500 pounds, all equipped with battery powered electrical systems that keep these trucks on the job for longer periods of time—giving you big truck operation at small truck cost. Yale Worksavers are highly maneuverable, simple to operate, and are ideal for handling on floors with limited load capacity.



VOLTA REDONDA, Brazil – At the largest steel plant in Latin America, Cia. Siderurgica Nacional in Volta Redonda, 30,000 pound capacity Yale electric trucks are used to move steel coils in the cold reduction mill. These Yale trucks and others are used throughout the mill, easily handling the flow of materials to and from production and storage areas. Yale electric trucks are designed to stay on the job . . . to give long life with minimum maintenance.

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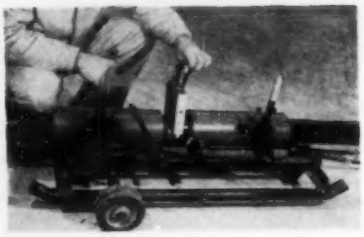
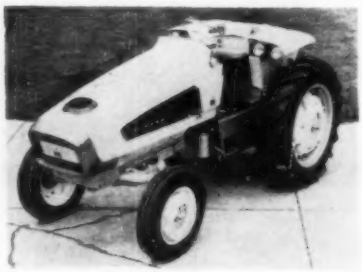


Joining plastic pipe

Lengths of high-density polyethylene pipe are quickly and accurately joined with the new machine shown above, designed by Phillips Chemical Co., Bartlesville, Okla., U.S.A. Ends of pipe are heated, then gently pressed together. The machine comes in three sizes: for 5 cm and smaller pipe, for 5-10 cm, for 8-20 cm pipe.

Aluminum joined to rubber

A process for vulcanizing aluminum sheet or foil onto rubber has been developed by Reynolds Metals Co. and shortly will be used by another U. S. firm, Rubbermaid Inc., to make a stove and counter mat. The process has been made possible, Reynolds reports, by a special aluminum coating its laboratories have developed. Reynolds applies the coating, then ships the combined material to the customer.



Tractor of the future

A glimpse into the future of the farm equipment industry is provided by this experimental tractor, under study by International Harvester Co. of Chicago. The research model has a 80-hp gas turbine engine (weighing only about 40 kg) and hydrostatic transmission. Hot gases produced from ignition of an air-fuel mixture spin the vaned turbine wheel. The engine operates a variable displacement pump which energizes the transmission. Oil at high pressure acts on the pistons of a radial hydraulic motor installed in each driving wheel. To start the machine you just push a button. After that, one control changes forward and reverse speeds and stops the tractor. The company wants to improve fuel economy and reduce noise before making the tractor available commercially.

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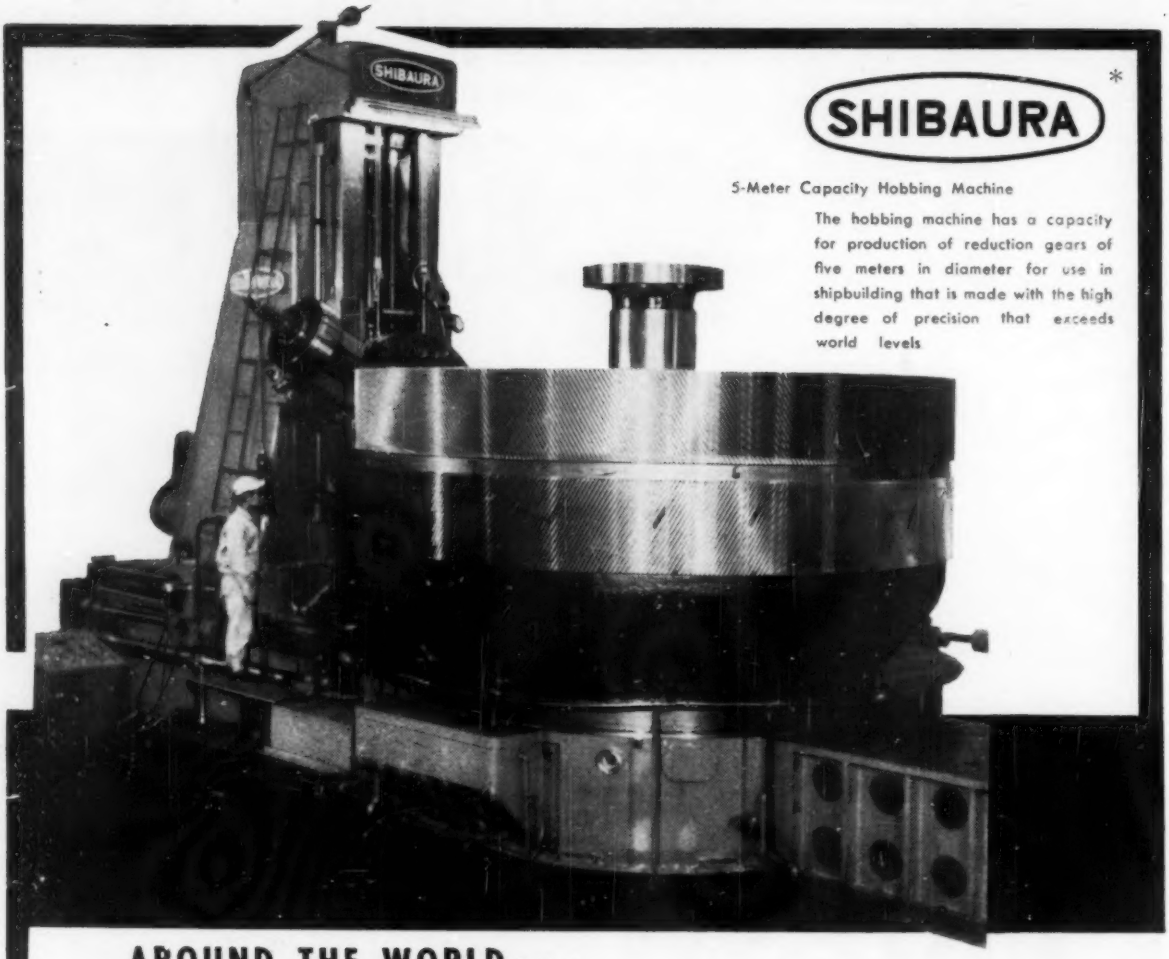

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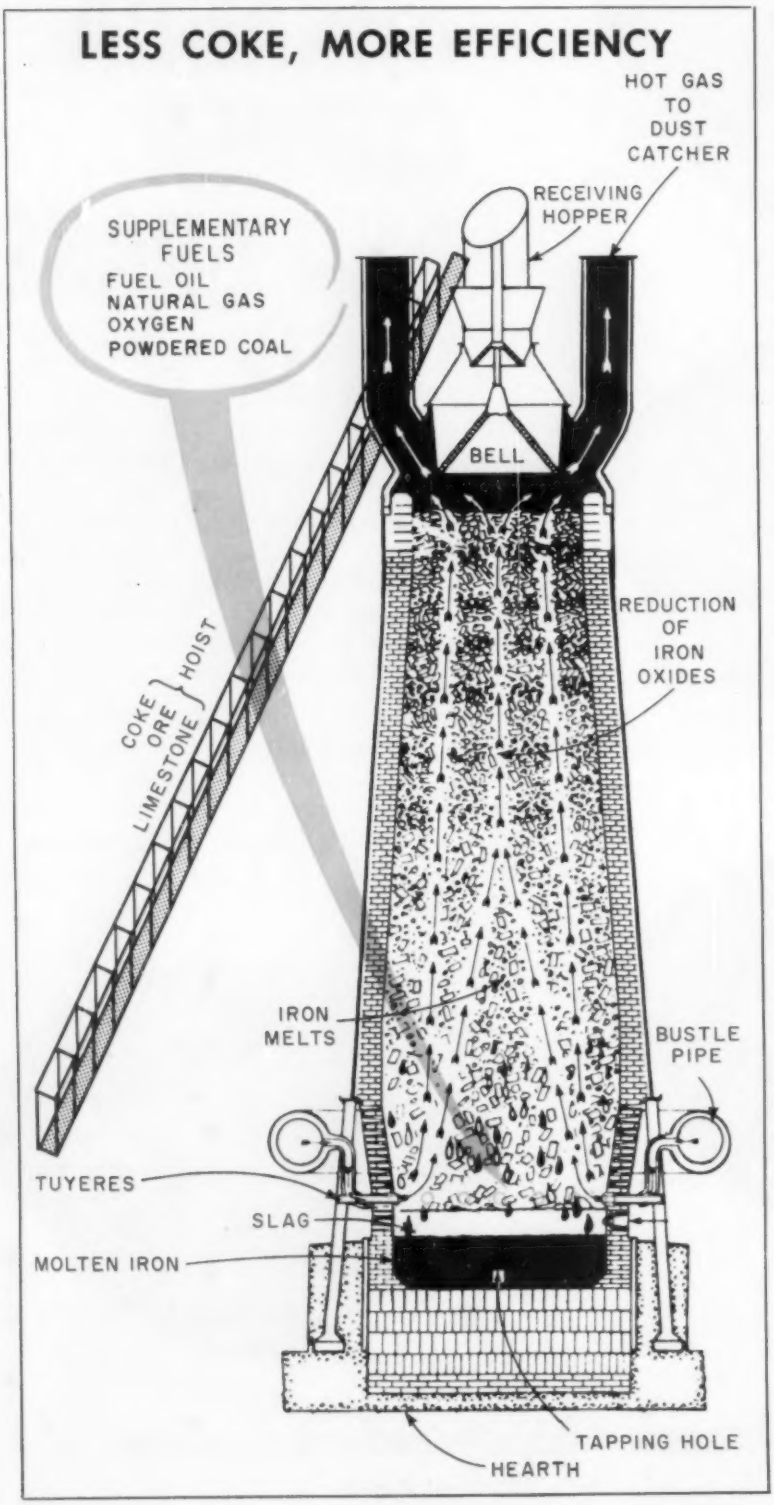
Blast Furnace Burns Brighter



Use of other fuels with coke means efficiency for ironmakers, more business for chemical and petroleum suppliers.

THE TECHNOLOGY of the blast furnace, long neglected, is now taking some important forward steps. The results may well have a powerful impact on a broad spectrum of business—from ironmakers to steel consumers, from petroleum producers to chemical marketers.

It appears now that the iron and steel industry's blast furnaces will for the first time be free from total dependence on coke. Blast furnaces will be fed substantial amounts of supplementary fuels—at first natural gas, fuel oil, and oxygen; later perhaps pulverized coal, industrial gases, coke-oven gas, nitrogen, and steam.

I. Changes Everywhere

Injection of new fuels into the blast furnace can bring important industry changes. In coal-poor areas of Latin America, large blast furnaces may become more economic. In regions where carbonaceous fuels of one kind or another are plentiful, the new fuel processes may slow down the development of direct reduction systems which produce iron or semi-steel without the blast furnace (IM—Nov. '60).

The benefits should be general. Iron producers and consumers will be happy because the new techniques will produce purer metal at a lower price. Existing furnaces will turn out more iron, under more closely-controlled conditions, and with savings in maintenance and operating expenses. And petroleum and chemical companies will have found an important customer for their fuel oil, natural gas, oxygen, and other chemicals. Powdered coal also may well find a broader market.

The injection of supplementary fuels into the blast furnace is not new. But only recently have the techniques moved from the labora-

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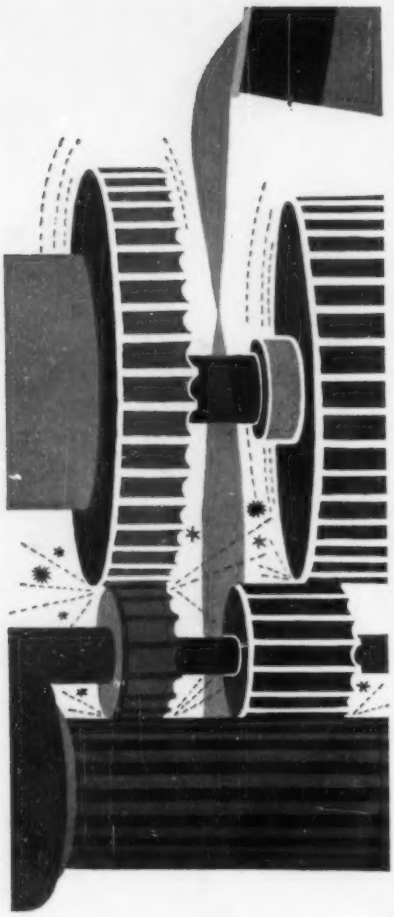

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tory into the steel works itself. Today pilot-plant and semi-commercial operations are moving ahead in at least a half dozen countries—the U.S.A., Canada, Belgium, France, Britain, the Soviet Union—and all reports are encouraging.

• **Economies**—In the U.S.A., for example, blast furnace "F" of the Colorado Fuel & Iron Corp. reports these savings: (1) With the injection of fuel oil into the furnace, coke consumption is cut from 800 to 675 kilograms per metric ton of ore; (2) when natural gas is combined with fuel oil, coke use drops to 600 kilos per ton of ore; and (3) when the two supplementary fuels are enriched with oxygen to heighten their burning temperature, coke consumption comes down to 500 kilos per ton of iron ore.

This means a savings of 300 kilos of coke—valued at about $6.00 in the U. S., a little more in Europe—for each ton of iron ore melted down. For a blast furnace handling 2,000 to 3,000 tons of ore a day, as many do, this trims millions of dollars off of operating costs.

The economies do not stop with a decrease in coke consumption. Less limestone is needed for removal of the earthy materials in the ore; better control of the furnace's operation is insured. And with the decreased use of coke, there is less need for capital and maintenance expenditures on the coke ovens—a substantial item to iron plants.

The Colorado Fuel & Iron results with supplementary fuels are confirmed elsewhere. In Britain, the Iron & Steel Research Association has been working with the National Coal Board in trial injection of fuel oil, natural gas and powdered coal. Coke consumption has been cut 33% to 34%. Similar reports come from an experimental furnace at Liège, Belgium, and from two works in France.

Soviet technologists are making even more optimistic claims. According to a report in *Journal of Metals*, they say that their blast furnaces using natural-gas injection are producing 30% to 35% more metal than U. S. furnaces of the same size. At the Urals Ferrous Metals Institute, in a region where natural gas is unavailable, the Russians report that they are using refinery waste products—essentially a low-grade fuel oil—and effecting considerable coke savings and a 14% increase in furnace output.

II. Learning About Furnaces

How did this all come about? Why has the industry relied exclusively on coke for so long? Why have not liquid and gaseous fuels been used before?

A complex of answers could be offered. Some of them are technical. The blast furnace is an intricate and somewhat mysterious piece of equipment, and only recently have scientists and engineers learned more about what goes on in a 60-meter-tall inferno. With temperatures rising to over 1700 C, only cold samples of the material in process can be studied. Now automatic photography, closed-circuit TV, and radioactive tracing are providing new information.

But non-technical factors also explain the steel industry's delay in improving the blast furnace—and its present haste to do something about it. The industry is under terrific pressure. Competitive materials have been moving into steel's established markets, and new techniques of direct reduction are forcing a re-examination of the established practices of reducing ores to metal.

With costs always rising, the industry has to justify the huge investment it has in blast furnaces and related facilities—in maintenance, in coke ovens, and the rest. Says one steel executive, explaining his company's interest in the new techniques:—"It is the only way we know of delaying the replacement of coke ovens which are rapidly becoming obsolescent."

• **Coke's Role** — Such conditions have led to an intensive study of the dual purpose of coke in the furnace: the production of carbon monoxide (CO) and heat. In a conventional blast furnace, coke, limestone, and the ore are poured into the top of the brick-lined steel tower, and pre-heated air (about 700 C) is blasted in through a circle of nozzles—called tuyeres—near the base.

It is through these tuyeres (see drawing on preceding page) that

supplementary fuels now are being injected. The overall effect is to create more CO lower down in the tower, and to raise the temperature. Thus the CO combines with more oxygen in the raw metal, less partially-used gas goes out the top, and the furnace does its job more efficiently. And the supplementary fuels normally are less expensive than coke.

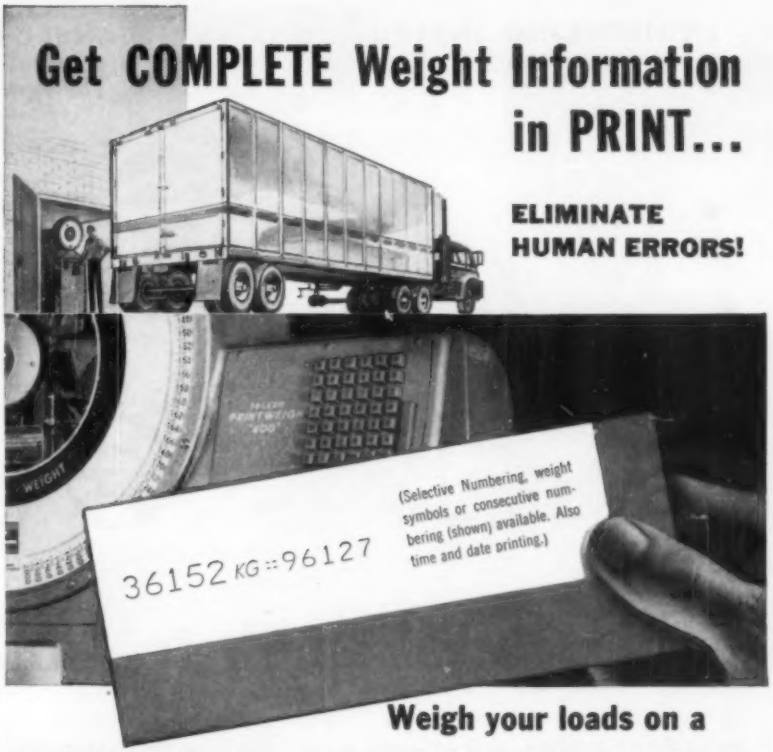
III. What Fuels?

To date, fuel oil and natural gas, with and without oxygen, are the only fuels that have been given full-scale industrial tests. Experts are pretty much in agreement that the choice between the two is largely a matter of economics. Either fuel oil or natural gas—and perhaps other liquids and gases now under test—can do a comparable job in reducing coke consumption and improving furnace efficiency. Which fuel will be used will depend primarily on its availability and price in a given area.

In the U.S.A. and Canada, where cheap gas is available everywhere, it will be the supplemental fuel of choice. In Europe, fuel oil or pulverized coal will be generally used —though gas availability is increasing. And in other areas, reclaimed industrial gas may be the fuel of choice.

• **Direct Reduction?** — Improvement of blast furnaces is not expected to do away with the many programs to refine iron ore by direct reduction. But it will add a new factor to the problem. Management contemplating new or enlarged ironmaking capacity will have a wider choice. If a small plant is required, or if both petroleum and coal are scarce, direct reduction may be the answer. In other cases, management will be able to justify the sizeable capital investment in efficient multi-fueled blast furnaces.

Use of supplementary fuels will also help do away with the steelman's nightmare—the "cold furnace," when the coke is not burned clear of the tuyeres, and pockets of sticky iron collect nearby. Ordinarily it takes 14 to 16 hours to correct this condition by changing the coke burden. With fuel oil, the correction can be made in six hours or less, even faster when oxygen is used. ●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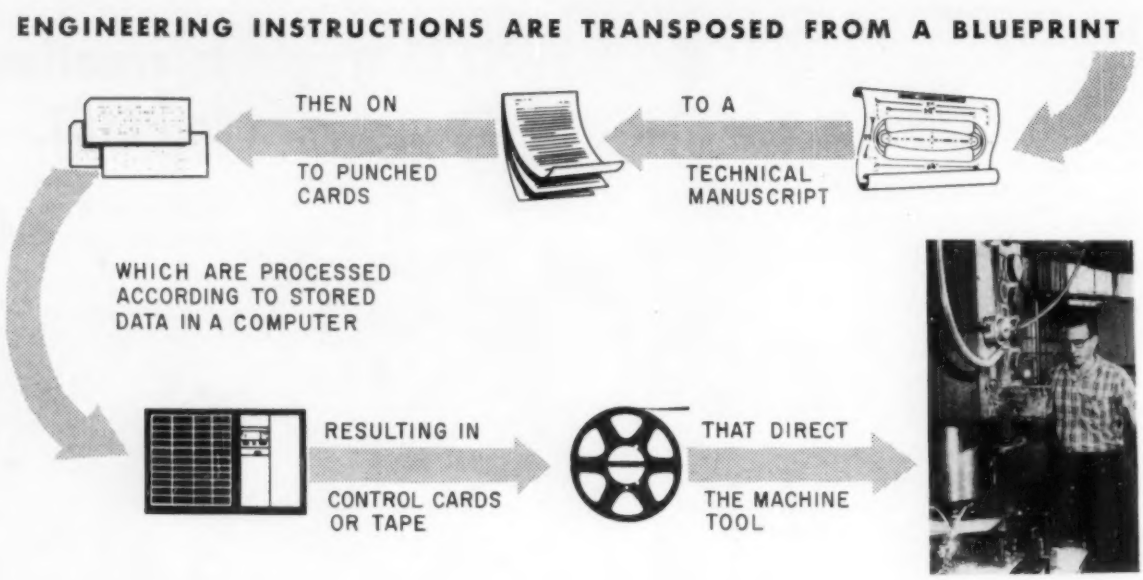


Small Shops Look to Automation

THE COST of preparing complex instructions on punched cards or tape has held back the growth of numerically-controlled machine tools. Now automated metalworking may become more feasible for small and medium-size shops, thanks to a new low-cost programming system developed by two U. S. companies, the Remington Rand Univac division of Sperry Rand Corp. and Rohr Aircraft Corp.

A unique feature of the system, diagrammed above, is its ability to feed tape to the control devices of many different manufacturers. Among the machine tools being guided automatically by computer-generated instructions at Rohr's California aircraft plant are a Giddings & Lewis profiler, a Morey vertical profiler, Cincinnati skin mills, and a Cincinnati traveling column. These machines are used to shape a variety of aircraft parts.

• **Programming**—The new system greatly simplifies compiling the complex instructions that are needed to guide numerically-controlled tools. In the past, the job demanded a large—and expensive—computer. And the cost was prohibitive except for the largest metalworking plants.

The Univac-Rohr system not only uses a medium-scale computer, a Univac solid-state 80 or 90, but it will even make numerical control available to metalworkers who do not have computers. Univac Service Centers throughout the world are getting ready to help machine shops program their punched-card data into instructions for numerical control equipment.

Rohr will be offering an even broader service. When its own computers and related equipment are not too busy, it will make its equipment and staff available under contract to others, and do the complete programming job from drawing—or even verbal instructions—to the final control cards or tape.

• **How It Works**—As the first step in preparing a numerically-controlled job, a programmer takes thousands of details from an engineering drawing and lists them on a "manuscript." Here he puts down all the details about part geometry, feed rates, spindle speeds, and the action of auxiliary machine tools.

The manuscript data are then punched onto cards, which are fed into a reader for transmission to the computer itself. The data are interpreted and processed according to a program previously stored in the computer. The final control cards—or tape converted from these cards—contains all the control data needed to guide the machine through the manufacture of a part.

• **Many Bonuses**—Through use of numerical control, Rohr has sharply cut its manufacturing costs for aircraft parts. And the new system has practically eliminated the scrap that used to come from rejects.

But these are only two bonuses of the new system. More significantly, numerical control makes possible the manufacture of intricate parts—especially for the aircraft industry—that are not feasible by any other means. The compound contours demanded by modern aircraft and missiles often are beyond the reach of conventional machine tools.

"Another demand for numerical control has come from the present scarcity of skilled labor," observes Nils O. Olesten, Rohr's numerical control supervisor. Fewer young men are training to be machinists. Numerically-controlled milling machines do not need such men, says Olesten. The margin for human error has been eliminated, and men with a minimum of training can take over.

Modern manufacturing, too, calls for closer tolerances. Here again numerical control helps. "Control media in itself is absolute—has no tolerance," notes Olesten. With the new system, the

only tolerance consideration is the machine itself.

• **On the Horizon**—Dause L. Bibby, president of Remington Rand Univac, sees a great future for numerical control. Knowledgeable authorities, he says, estimate that 90% of machine tool production will be done through automatic controls by 1970.

Confirming Bibby's words is the practice of some aircraft builders now to specify "numerical control" for some of the components they order. Also, note that Rohr has recently begun to operate a filament winding machine by numerical control—and experts are predicting that the technique soon will be used for the milling of dies. ●

Still Another Way To Desalt Water

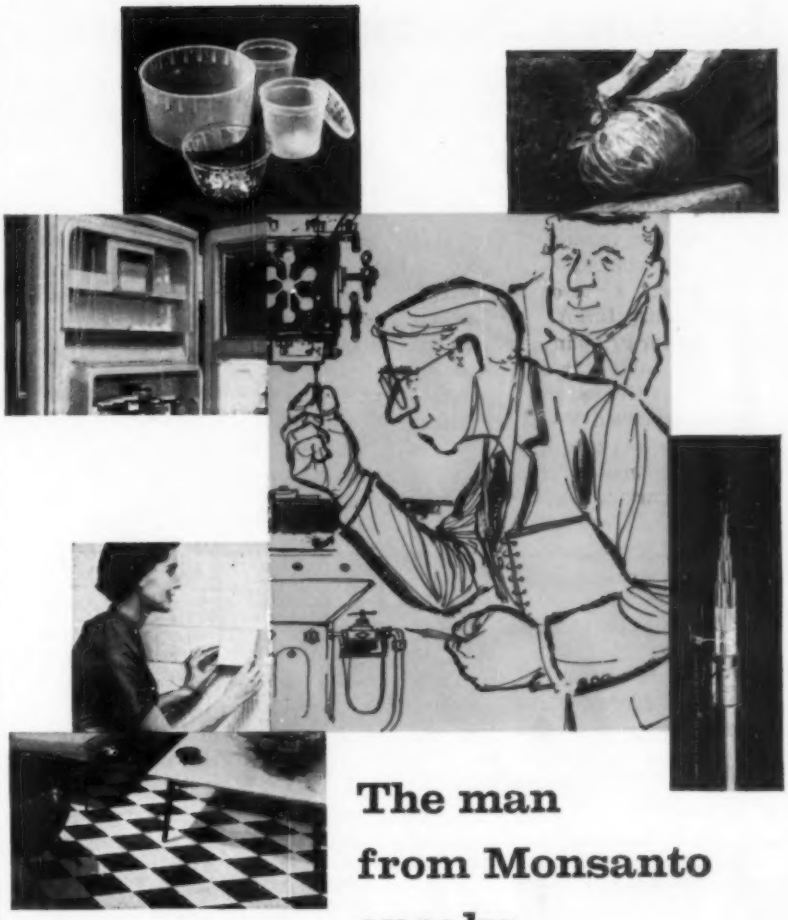
THE SEARCH for an adequate supply of cheap fresh water is stimulating research into many desalting methods. Recently the improved prospects for the "hydrate process" were outlined to a meeting of U.S. chemical engineers by A. J. Barduhn, a researcher at Syracuse University.

• **Hydrate Formation** — This process, which also is being studied by U.S.A.'s Koppers Co., introduces an organic material in the salt water to form a hydrate. The organic hydrate then decomposes to yield salt-free water.

Koppers generally has been using propane as the organic material. It is inexpensive but requires high pressures and temperatures close to freezing for hydrate formation.

Working under the auspices of the U.S. government's Office of Saline Water, Syracuse has been looking for organics that form hydrates under all conditions. The most promising to date, *Chemical Engineering* reports, are methyl bromide and two fluorinated hydrocarbons.

• **Pros & Cons**—Syracuse's methods result in lower costs for heat exchange and refrigeration, but the materials tested are more costly than propane. And, due to process losses, this price differential would affect initial investment as well as operating costs. ●



The man from Monsanto speaks fluent Plastics

Plastics are the most "willing" of basic materials. If one plastics formulation can't do the job, another can readily be made to. Monsanto has long been tailoring plastics to meet specific application requirements. The men from Monsanto can talk fluently about six major plastics families, subdivided into hundreds of precise formulations (there are 96 Lustrex* Styrene compounds alone!) They are travelling technicians, versed in plastics technology, experienced with local manufacturing needs, highly qualified to help with on-the-spot guidance all over the world. Discuss your plastics requirements with your local Monsanto representative, or write for additional information about Monsanto Plastics to Monsanto Chemical Company, Overseas Division, St. Louis 66, Missouri, U. S. A.

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Factories Shipped Anywhere

THROUGHOUT THE WORLD businessmen with limited capital and limited industrial experience yearn to set up small manufacturing plants. But often they do not know where to turn for design and engineering help, or for the machinery they need to get started.

G. Robert Cox, of Pittsburgh, Pennsylvania, U.S.A., sees an opportunity for profit in showing them how, and selling them the equipment too. He recently organized a company called Packaged Plants Inc., which last month put its first product—a small soapmaking plant—on the market.

• **Fish and Ice**—Cox says that soap is only the beginning. He hopes soon to offer complete, ready-to-operate units for processing fish, laminating glass, fumigating, and ice-making.

The plants will be priced from $50,000 to $200,000, and are supposed to be complete enough and simple enough so that a buyer with a minimum of experience can start manufacturing right away. The plant's design calls for a minimum of skilled labor—a decided asset in developing nations. And Cox says that Packaged Plants Inc. will help arrange financing.

"We think this is a good way to help these countries develop and stabilize," Cox told INTERNATIONAL MANAGEMENT. "Packaged plants are something the small businessman can own and operate."

• **Size of Package**—Here is the extent of the "package" offered by the new company:

—Description of each phase of a process, including its purpose, results, by-products if any, quality control methods.

—All necessary process equipment, piping, instrumentation, materials handling machinery, test kits, and fire fighting equipment.

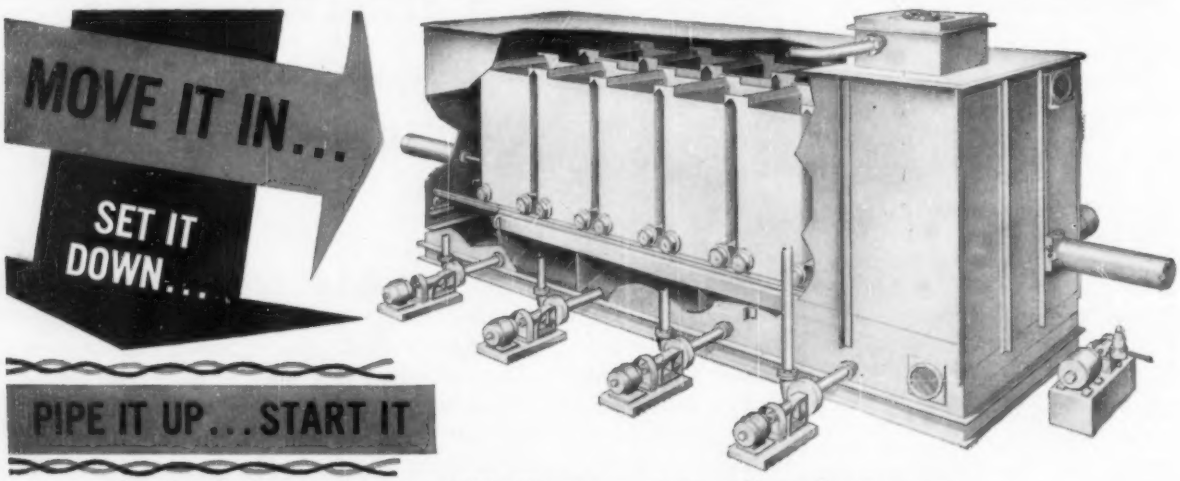
—Building specifications and an installation manual giving full details and drawings; under the contract, a Packaged Plants engineer supervises assembly and initial operation.

—An operating manual describing the quantity and kind of raw materials required, the details of jobs, testing procedures, operating and maintenance instructions for each piece of equipment.

The soap plant uses a full-boiled process to produce fine white toilet soap. Yearly output is rated at 90,000 kilograms of quality white perfumed soap with the owner's brand imprinted, plus 45,000 kilograms of liquid, chip or bar laundry soap. Capacity can be readily expanded by adding more kettles.

• **Manufacturing Affiliate**—Most of the equipment for the packaged soap factory is expected to be supplied by J. P. Devine Manufacturing Co., an affiliated company in Pittsburgh. Devine manufactures mixers, blenders, autoclaves, and other processing equipment.

A prospective buyer must provide Packaged Plants with details of the proposed plant location, type of fuel, water and electric service available, transportation and nearest seaport, and the client's manufacturing experience, if any. Then Cox can furnish the buyer with a firm price on the "off-the-shelf" plant of his choice. ●



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The Anderson Horizontal Hydraulic Basket Extractor is designed to process granulated or flaked oil seeds with equal efficiency. Oil content in the material can range from 9 to 18%. However, pressed vegetable oilseeds and other materials such as cracklings, containing higher or lower percentages of oil or grease may be processed. Each Extractor is factory assembled and tested, shipped ready for operation. Write for complete details and literature.

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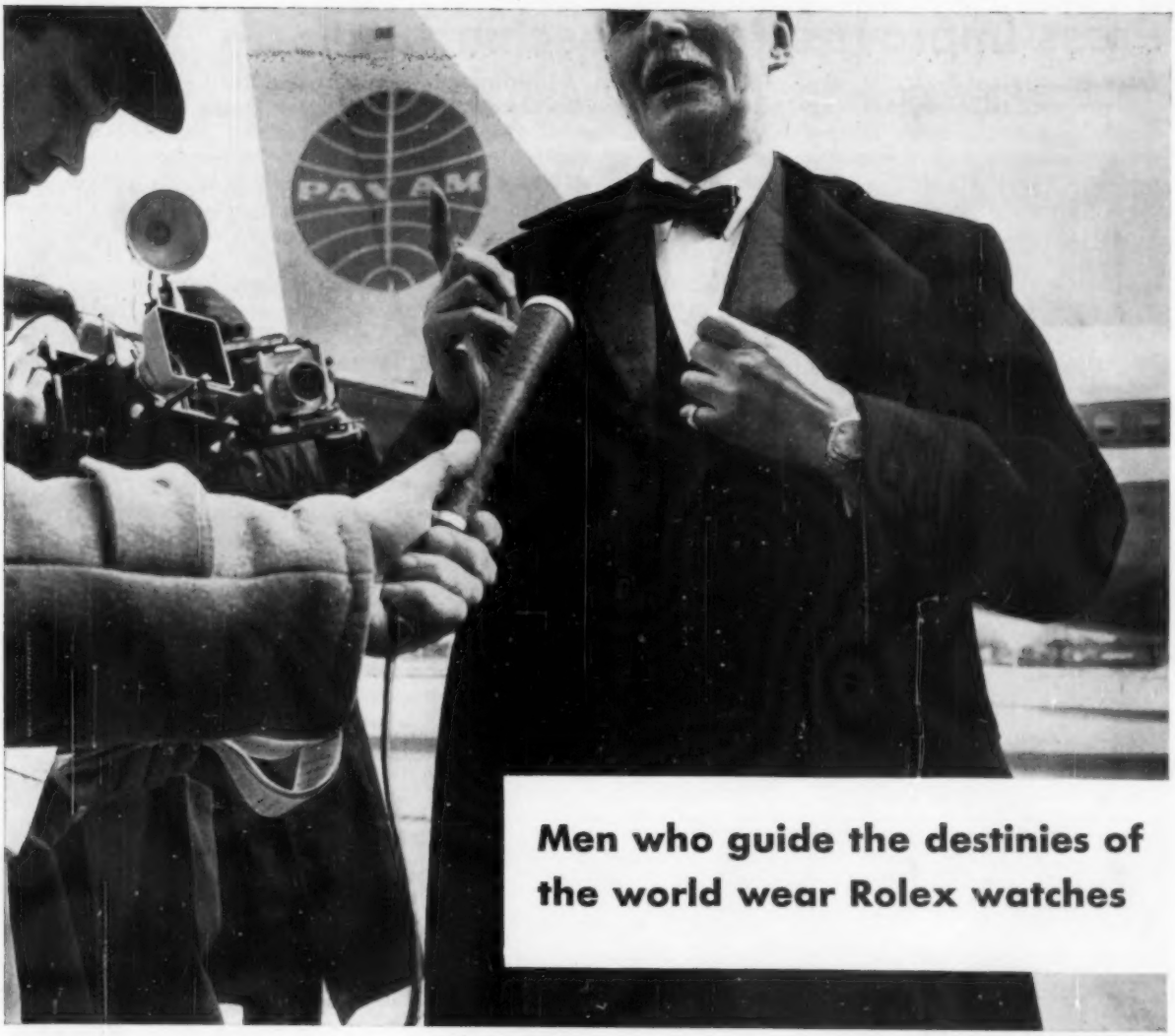

Men who guide the destinies of the world wear Rolex watches

YOU KNOW their names as you know your own. You know their faces from a thousand newspaper photographs, their life stories from a hundred magazine articles. You have seen them and heard their voices on newsreels and on your television screen. Their actions and decisions influence the pattern of our lives.

We cannot mention their names, or show pictures of them. It would not be fitting to do so, for they include royalty, the heads of states, great service commanders. But we invite you to look carefully at the next pictures that you see of them, at their wrists as well as their faces and clothes. You will notice that in almost every case they wear a wrist-watch. That watch will most likely have been made by Rolex of Geneva.

We are proud of the service given by Rolex watches to so many eminent men. It is scarcely necessary to point out that the performance of these watches is, in the highest degree, accurate and dependable.

The Rolex Oyster Perpetual DateJust, *most remarkable achievement in watch-making. Every Datejust is awarded an Official Timing Certificate by a Swiss Institute for Official Time-keeping Tests with mention "Especially good results." This accuracy is protected by the famous Oyster case, guaranteed 100% waterproof to a depth of 165 feet under water. The watch is self-wound by the Perpetual rotor mechanism, and the date on the dial, changing instantaneously every midnight, is magnified by the Cyclops lens for easy reading.*

A ROLEX
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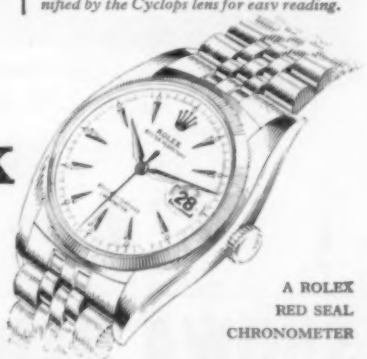
CHRONOMETER

The Rolex Oyster Perpetual *—culmination of three Rolex triumphs. In 1910 Rolex gained their first Official Timing Certificate for a wrist-chronometer. In 1926 Rolex invented the Oyster watch-case, the first truly waterproof case in the world and still the finest. In 1931 Rolex invented the first rotor self-winding mechanism. A new refinement of this Perpetual rotor powers the Oyster Perpetual silently and automatically.*

ROLEX

Official timepiece, Pan American



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Press Improves Pulp Bleaching

PAPERMAKERS in the U.S.A. and elsewhere will be closely watching operations during coming months at a 120-ton/day pulp mill in northern New York, where St. Regis Paper Co. is commercially testing a new process for high-density bleaching of groundwood pulp with hydrogen peroxide.

Pilot-plant studies have shown that the new process can bring substantial savings to groundwood and semi-chemical pulp mills—savings that can pay off investment costs in three years.

• **Effective Press**—The key to the new process is a continuous screw press that dewaters the pulp as it is fed to the bleaching plant. It is this operation that yields the dry pulp essential to superior hydrogen peroxide bleaching.

Unlike other bleaching chemicals —chlorine, hypochlorite, bisulfite, hydrosulfite — hydrogen peroxide does not require water for solution and uniform blending with the pulp. Its efficiency is markedly improved as drier pulp is processed.

But in the past, separating unbleached pulp from the white water that carries it out of the wood grinding and wash plant has always presented problems. Part of the water is drained off by vacuum suction, but presses must be used to squeeze the pulp to the consistency needed.

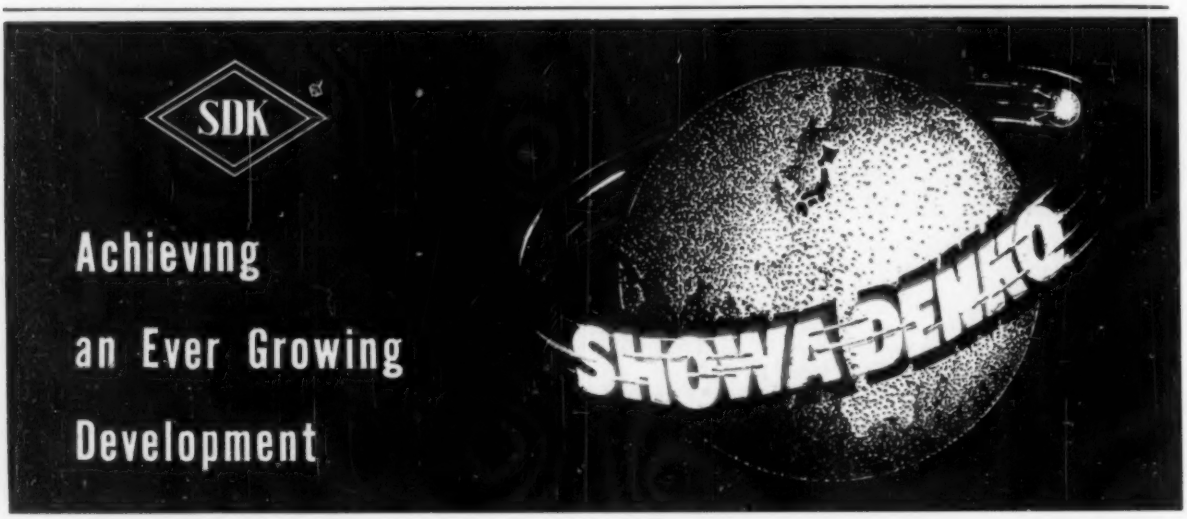
The lack of suitable presses has held back the high-density process in big plants. Disc presses have proved successful in small-capacity operations, but the St. Regis plant is said to be the first installation using a continuous high-capacity (50 tons/day) screw press.

• **No "Fish Eyes"** — Three presses are in use at the New York mill. Designed by a chemical machinery company working closely with a hydrogen peroxide producer, the presses dewater paper stock from 12% to more than 30% air-dry pulp. And most important, 10 months of trial operations have shown that this press does not form hard knots of fiber between the moving parts—knots that end up as "fish eyes" in the finished paper.

Except for the unique screw press, the St. Regis process is typical of those known to pulp manufacturers as the "continuous high-density tower system." In this process, paper stock containing about 4% dry pulp in white water slurry is fed to a vacuum thickener, which pulls white water inward through a rotating screen cylinder.

The pulp stock that mats onto a rotating screen is continuously scraped off and fed by conveyor to the bottom of the screw press. From the top of the press, it is conveyed to a disc mixer, to be blended with hydrogen peroxide.

• **Better Paper**—If costs can be kept in line with alternative bleaching methods, hydrogen peroxide is a natural for groundwood pulp, *Chemical Week* reports. Due to the presence of wood chemicals, groundwood is of poor color. But hydrogen peroxide can improve paper brightness 10-18 points (on a General Electric brightness meter), compared to the 6-8 points offered by hydrosulfite bleaching. (*Chemical Week, Sept.* 23, *p* 81)



PRODUCTS

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METALS: ALUMINUM, ALUMINUM ALLOYS, FERROALLOYS, METALLIC SILICON, PURE IRON

ELECTRODES: SYNTHETIC GRAPHITE ELECTRODE, REACTOR GRAPHITE, CARBON PRODUCTS

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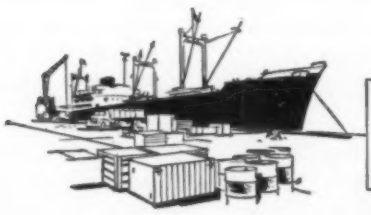

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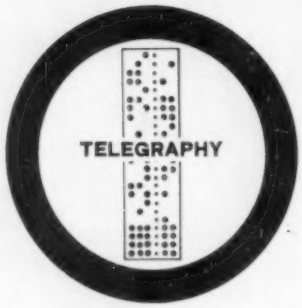

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Fish Battle . .

. . rages over program to supply proteins to world's undernourished.

A TECHNICAL-POLITICAL DEBATE has been boiling up in Washington—about fish meal. It comes as an aftermath of renewed interest in this protein-rich product, after Peru began producing it last year and prices dropped. The United Nation's Food & Agricultural Organization has begun conducting studies aimed at increasing consumption and stabilizing prices.

Most of official Washington agrees with the U.N. that flour made from the ocean's fish can be of great aid to the world's undernourished millions. George McGovern, President Kennedy's Food-for-Peace administrator, sees in fish flour a means of overcoming the serious grain shortages in many parts of the world. He is enthusiastically seconded by Secretary of the Interior Stuart L. Udall, who has been encouraging U.S. fishing interests to explore techniques for producing fish meal for export. And Secretary of State Dean Rusk recently cabled 98 U.S. diplomatic posts abroad to look into local attitudes and prospective markets for the fish food.

• **No, No!**—A dissenting voice to all this is raised by George P. Larrick. He is commissioner of the Food & Drug Administration, charged with guarding the U.S. consumer's stomach against contaminants. His agency has been called into the dispute because U.S. fishermen believe they will have difficulty lining up foreign sales unless they first get FDA approval for marketing at home.

Larrick's position is that the FDA fights a constant battle to keep animal excrement out of food sold in the U.S.A. He contends that if the FDA approves of meal made from whole fish, including the intestines, the agency's position in future U.S. legal tests will be weakened.

• **Corals**—McGovern, expressing the rage of the promoters, warns that a noble scheme is in danger of getting "wedged among the corals of bureaucracy." He charges the FDA with making a "purely aesthetic evaluation based on an overly-sensitive contemplation" of the origin of fish flour, without consideration of the heat and chemical treatment that cleans, deodorizes, and purifies the food.

The FDA now is reported reviewing its position, and it may come up with proposed standards that would permit the processing of whole fish for U.S. use. If it does not, U.S. processors are expected to go ahead with their contacts abroad and plan on making fish meal free from the jurisdiction of the U.S. regulatory agency.

Air to Shield Cafe

A RESTAURANT at New York's 1964 World's Fair will be walled on three sides by curtains of air, according to plans of Gas Inc., an association representing the natural-gas industry. Glass will be used for the fourth wall, separating the restaurant from the rest of the association's $6-million exhibition building.

The unusual arrangement of walls, probably the world's most extensive air curtain, was planned to demonstrate the versatility of air currents. Natural gas will be used for heat and air conditioning, but a system of air belts will be used to maintain these conditions in the 200-seat restaurant.

The air walls will be formed by shooting a stream of air between the ceiling and the floor. This continuous flow of air will keep out breezes, rain, and insects and will be hardly noticeable, *Engineering News-Record* reports. Sound, however, will pass through the air walls.

Gas Inc. also will have an unusual air-conditioning system for the exhibition area of its building. A horizontal air belt will blow conditioned air across the exhibit hall about six meters above the floor level. This will restrict air conditioning to the lower two-fifth of the exhibition space.

In both the restaurant and exhibit area, distribution systems will pass conditioned air up through honeycomb grills at the floor perimeters. Grills in the exhibition area will be concealed by indoor landscaping. ●

4 new reasons why Cyanamid research helps you

WHETHER YOU *make* or merely use paper, paint, electrical equipment, plastics—or virtually anything else—Cyanamid's intensive, progressive research constantly produces for you. Here are just four new developments that we think you should know about:

Better Paper—Lower Cost. ACCURAC* 24 retention aid is a new and highly effective aid to paper-makers. It efficiently retains fillers and costly pigments such as Titanium Dioxide, as well as colored pigments. It permits matching of color specifications, with less *pigment*. Retention of fines gives improved sheet formation, less fines in white water, less load on save-alls, less two-sidedness in colored paper — *and* faster machine drainage! Better paper at lower cost with ACCURAC 24 is good news to producers and users alike.

Light without Bulbs—and More. CYANOCEL* chemically modified cellulose is being hailed by the electrical industry. Its properties of high dielectric constant and low-dissipation factor can improve many existing electronic products. *Electroluminescence*, for instance! A sheet of pure light in any shape and many colors for walls, ceilings and decorations is a distinct promise. Its first commercial application is in a new electroluminescent lamp, in which CYANOCEL is cast as a thin, phosphor-containing film between conducting surfaces, one of which is transparent. Because of the high dielectric properties of films, it promises a significant step forward in the miniaturization of capacitors and other electric components.

Industrial Finishes—without Fear of Fire. MELAQUA* 600 resin is bringing a sigh of relief to industrial finishers and other users who must have the durable hardness and high gloss of solvent-based enamels. For it enables the paint industry to offer these advantages in a water-dispersed enamel that's totally fire-safe. MELAQUA 600 produces smoother films and brighter colors, as well...and produces a finish with high resistance to weather, salt spray and heat.

Anti-Static Agent—for Cleaner Products. CATANAC* SN anti-static agent is a new and potent anti-dust weapon for producers or processors of plastics, fabrics, wax—and virtually any non-metallic, dielectric substance. In such materials, friction of handling or dry, moving air produces static electricity. Static attracts dust from the air. But CATANAC SN (in the composition itself *or* on the surface) reduces this nuisance. Products stay brighter, cleaner on shelf or display . . . and, of course, sell better. It is particularly useful in reducing the accumulation of lint and dust in textile manufacture, and on products that are waxed and polished by buffing. In fact, the widespread utility of CATANAC SN is probably applicable to a host of other industries—including, quite possibly, your own.

Interested? Technical data on these new Cyanamid products is available on request. For information on any of the General Chemicals products of Cyanamid International, contact your nearest Cyanamid distributor or write to:

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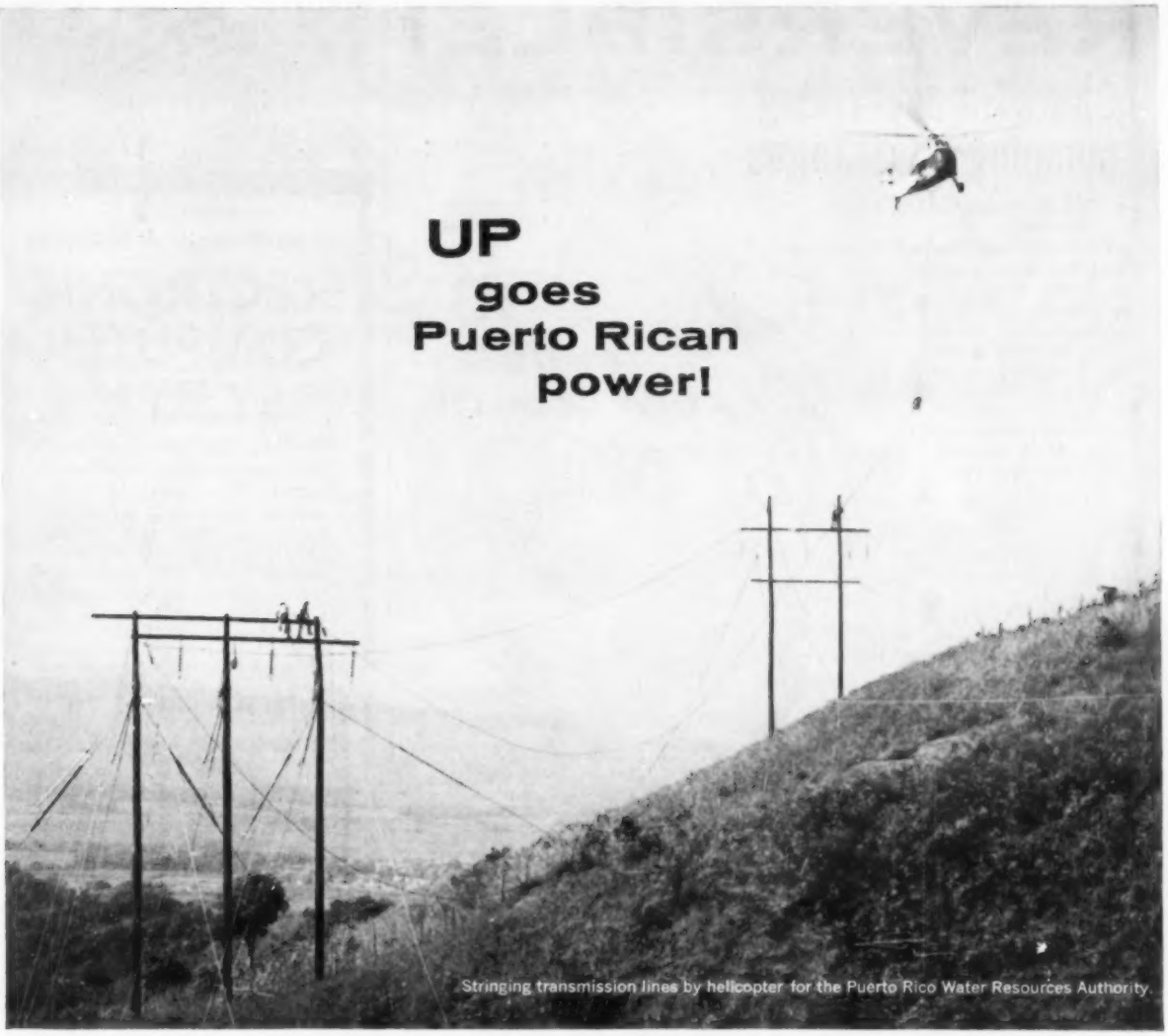

Stringing transmission lines by helicopter for the Puerto Rico Water Resources Authority.

One of the world's fastest-growing electric power systems, the Puerto Rico Water Resources Authority, is now scheduled to receive a big 82,500-kilowatt boost — to a total generating capacity of approximately 725,000 kilowatts*.

Steam for this new electric generating capacity will be produced by an oil-fired steam generator recently ordered from Combustion Engineering, Inc. This will be the 11th C-E utility boiler for the PRWRA since 1947, and one of the system's four largest. It is designed to deliver 630,000 pounds of steam an hour.

To be known as Unit #4 at the South Coast Steam-electric Station, the new boiler will stand over 10 stories high and will use the fuel-saving "reheat" design. As an example of the growth in size of boilers for the Puerto Rico Water Resources Authority, each of the system's last four units has approximately *four times* the steam generating capacity of all of the first four installed, which were ordered from C-E between 1947 and 1950.

As in Puerto Rico, C-E steam generating units are an integral part of industrial expansion programs throughout the free world. Whether the application is large or small, you can benefit from Combustion Engineering's experience and engineering skill in filling your steam needs. For information, consult the C-E representative in your area, or write to the Export Department in New York.

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NEW BOOKS

OPTIMUM USE OF ENGINEERING TALENT is the first comprehensive book on the "care and feeding" of engineers. Every phase of effective engineering management is discussed—from basic objectives, responsibilities and organization of engineering to recruiting, compensation, supervision, professional development. *American Management Association,* 1515 *Broadway, New York* 36, *N. Y.* 416 *pages,* $9.00.

THE FOLKLORE OF MANAGEMENT, a new book by Clarence B. Randall—former president of the U.S.A.'s Inland Steel Company and adviser on U.S. foreign economic policy—gives shrewd and lively views on the myths that have taken root in management practice. *Little, Brown and Company,* 34 *Beacon Street, Boston* 6, *Mass.* $4.75.

REGIONAL ECONOMIC PLANNING: Techniques of Analysis for Less-Developed Areas is a collection of reports presented at the EPA's First Study Conference on Economic Development Problems. It reviews the current status of regional planning and administration at both the local and national level, introduces techniques of analysis and their role in development programming. *European Productivity Agency, OEEC,* 3, *Rue Andre Pascal, Paris XVI, France.* 467 *pages,* $6.00.

PHYSICAL DISTRIBUTION MANAGEMENT: The Logistics Problem of the Firm, by Edward W. Smykay, Donald J. Bowersox and Frank H. Mossman, puts into perspective all aspects of distributing the product to the customer. *The Macmillan Company,* 60 *Fifth Avenue, New York* 11, *N. Y.* 284 *pages,* $8.00.

STUDIES IN MANAGEMENT, by Guy Hunter, discusses the problems that should be considered when a personnel policy is formulated. The first half of the book is concerned with the timing and details of personnel policy and the aims and methods of management training. The nature and context of the industrial community in relation to society as a whole is also covered. *University of London Press, Littlepaul's House, Warwick Square, London* EC4, *England.* 158 *pages,* $1.47.

DIRECTORIES, REFERENCES

DIRECTORY OF FOREIGN ORGANIZATIONS FOR TRADE AND INVESTMENT PROMOTION lists—and describes—trade promotion and economic development organizations (both government and private) throughout the world. *Supt. of Documents, U. S. Government Printing Office, Washington* 25, *D. C.* 108 *pages,* 35¢.

THE YEARBOOK OF THE AMERICAN BUREAU OF METAL STATISTICS records for 1960 and prior years, mine and smelter production, consumption, imports and exports and other economic statistics on a world-wide basis. Introductory texts on the major nonferrous metals are included as well as U. S. duties on ore and metal imports. *American Bureau of Metal Statistics,* 50 *Broadway, New York, N. Y.* 139 *pages, soft cover edition,* $4.25; *hard cover,* $4.75.

Just published: THE DATA PROCESSING EQUIPMENT ENCYCLOPEDIA—the first standard source of comparative data on the subject. Vol. 1 contains detailed specifications of over 200 pieces of punched card, paper tape and other electromechanical equipment. Vol. 2 provides standardized specification entries for digital electronic computers, MICR systems and optical scanners. In addition there is basic reference material, directories of manufacturers and pricing charts. Quarterly supplements will keep the encyclopedia up-to-date. *American Data Processing Inc., Book Tower, Detroit* 26, *Mich.* $50.00 *per set;* $90.00 *with updating.*

The 1961 edition of PICK'S CURRENCY YEARBOOK, provides a complete description of 93 currencies and price movements in 36 international trading centers, rules for convertibility, data on currency administration and circulation statistics, exchange rates, trade and payments agreements, plus a section on gold and a directory of banks and firms with foreign exchange departments. *Pick Publishing Corporation,* 75 *West Street, New York* 6, *N. Y.* 633 *pages,* $40.00.

REPORTS, PAMPHLETS

The proceedings of both the domestic and international sessions of the World Traffic Conference are available in English, Spanish and French. There are papers on the design of interchanges on rural freeways, pavement surfaces, urban transportation, freeway operations, electronics in traffic control and highway accidents. *Institute of Traffic Engineers,* 2029 *K Street, N. W., Washington, D. C.*

Two J. Walter Thompson market studies: POPULATION AND ITS DISTRIBUTION: U. S. MARKETS, is based on the 1960 census and treats such matters as population movement and growth, age and income distribution, employment trends and the rate at which the U. S. is becoming urbanized. McGraw-Hill Book Co. Inc., 330 West 42nd Street, New York 36, N. Y. 471 pages $24.00. . . . India—with its 400 million people—is the subject of another JWT CONSUMER INDEX OF MARKETS. Twelve economic indicators, which were applied to towns with populations of over 20,000, give a representative picture of this nation's consumer market. *J. W. Thompson Co.,* 420 *Lexington Avenue, New York, N. Y.* 68 *pages,* $3.00.

Personal Business

THE "SEASON" IN NEW YORK

Paris may be the favored spot in Spring, but there is little to match a brisk autumnal stroll up Fifth Avenue. From now through the winter, New York City's "high season" is on.

It is a time when a great many foreign businessmen descend on the city. And this year they will find New York hospitality showing signs of improvement —the city fathers want everybody to get in practice for the 1964 World's Fair. And, too, New York must do its part in Washington's travel promotion drive. All visitors are urged to bring money to ease the U.S. international payments problem.

At Idlewild, the international airport, more staff and better facilities are making life easier for the new arrival. The formalities are speedier and the customs inspectors have even taken courses in smiling.

A guide for visitors

More hospitality, plus accurate information on hotels, restaurants, exhibits, trade shows, are available at the New York Convention and Visitors Bureau. Write them before coming to the city (they'll make hotel reservations) or visit them at Pershing Square, 90 East 42nd Street, New York City.

The Bureau publishes booklets on various activities in the city. One lists every art show, concert, trade show and sporting event in the New York area for a three month period. Others are specialized—shopping, hotels, educational tours (including visits to businesses and factories). The shopping guide, for example, lists all department and specialty stores, foreign money exchanges, art galleries and shops, beauty and health salons, theatre ticket brokers, book shops. If it does not list what you are looking for, ask the Bureau.

An evening at the theater

The 1961-62 offerings in music, theatre and art seem to be an improvement over those of the last few not-so-brilliant seasons.

During the first week in October, the theatre season was successfully launched with the opening of four shows—among them Noel Coward's "Sail Away", one of the brightest musicals going on Broadway. The other shows included "Purlie Victorious", also a comedy; "The Caretaker", a London import by Harold Pinter with a cast of three; and "Blood, Sweat and Stanley Poole"—a comedy of Army life.

Among the other shows to open this fall are "How to Succeed in Business Without Really Trying", which tries to make the businessman laugh at himself; "Kean", a musical based on the life of the 19th Century British actor Edmund Kean. Alfred Drake is the star, and first reports from Boston where it opened were excellent; "The Gay Life" takes place in Vienna in 1900 and is adapted from Schnitzler's "Affairs of Anatol". Be sure to check the current "off-Broadway" productions. They are often fresher, with new talent and new ideas.

Weekly magazines such as "Cue" or the "New Yorker" list all of them, and give additional information on movies, ballet, night clubs, art exhibits.

. . . and at the opera

In September, New York opera lovers faced their darkest hour, when labor difficulties threatened to cancel the Metropolitan Opera's entire season. But problems were solved, and since October 23rd, the Met has continued to give the usual outstanding performances—and they will continue through April 14th. They opened with Puccini's "Girl of the Golden West" with Leontyne Price, the superb new mezzo.

Tickets are hard to get: Plan ahead; if possible ask a friend in New York to help out.

The New York Philharmonic—though plagued by labor problems too—got off to a brilliant start under the baton of Leonard Bernstein. It's season will continue through May 6th, with performances four nights a week at Carnegie Hall.

Conventions and exhibits

Here is a list of some of the more interesting trade shows going on in the city during November and December:

—Association of General Contractors of America
—Exposition of Chemical Industries
—Production Material Show
—Shoe Show of America
—International Congress of Experimental Mechanics

The above listed shows are held at the Coliseum, at the New York Trade Show Building or at various hotels. A more detailed list with addresses can be obtained from the Convention and Visitors Bureau. And don't forget the U.S. World Trade Fair which will be held in New York in May.

Executive suites

Several of the new business palaces in New York—and palaces they are—are happy to show people about. Everybody's talking about the new Chase-Manhattan Building, recently completed at a cost of $122-million, with some of the most fabulous interiors ever seen in office design. The view from the top (the sixtieth floor) alone is worth the trip.

Take the guided tour through the Union Carbide Building, another of the many new modern buildings springing up on New York's East Side. It is the world's tallest stainless-steel building. Almost all of its interior walls are moveable, and instead of light fixtures, the entire ceilings are illuminated.

See the Seagram's Building too. And drop in at the Four Seasons on the first floor for dinner or at least a drink. Its expensive, but one of New York's most interesting restaurants.

Business with your pleasure

Business is at a high pitch this autumn, moving up with the national economy generally. This means, among other things, expanding sales opportunities for well-marketed imports (though the foreign autos are still having a difficult time). Don't make the mistake that some businessmen abroad do—that you need to make a huge investment to start selling the American market. Many persons have started very small, and done well.

The foreign businessman would do well to get a letter of introduction from his own bank to an individual in a New York bank who is well versed in the businessman's area of interest. His bank might quickly get in touch with the representative of a New York bank stationed in his country. In this event, the visitor may find, upon arrival in New York, that the bank not only has arranged for such services as letters of credit, or transferral and collection of funds, but has arranged many of the introductions necessary for completing his business. Remember that the large New York banks have broad business contacts throughout the U. S. A. and in all parts of the world. They have often been the catalyst in bringing businessmen together.

Departments of Commerce

But perhaps the two most important tools for the international businessman on his way to New York are the Departments of Commerce of New York State, and of the Federal Government. Working closely together, they supply the foreign businessman with all information necessary to complete business transactions in the New York area, or any place in the U.S.A.

The New York State Department of Commerce has an index of every business in New York State, and invites the businessman to browse through it. Trade consultants will assist him in making connections.

Before coming to New York, however, the department requests that the businessman write in advance, giving details of proposed business ventures while in New York. The address is 230 Park Avenue, New York 17 New York. The department will write or even call manufacturers and prepare introductions before the businessman has arrived.

The Department also offers a free medium for advertising. Because hundreds of letters are received weekly from abroad, the Department publishes a booklet called "Foreign Trade Opportunities for New York State Business". In it are listed all foreign businesses who have corresponded with the department. It gives the firm's address, a banking reference, and its business intentions in the U.S.A. This information is circulated throughout New York State. And if the state's resources are not adequate for the particular needs of a foreign visitor, it will put him in touch with the U. S. Department of Commerce whose business contacts reach across the U.S.A.

Meet Uncle Sam

The United States Department of Commerce—with its 280 foreign posts throughout the free world—can be a highly effective instrument for the foreign businessman who knows how to take advantage of its many services. Businessmen on their way to New York, or elsewhere in the U.S.A. should go to the diplomatic post nearest them well in advance of their trip, and make their wants known. The department will relay the information to the Department of Commerce in Washington. Here, details of the businessman's impending visit will be printed in the "Foreign Commerce Weekly" bulletin which is distributed across the U.S.A. It lists the international trader's business needs, and makes a note too of his American address. He may find, upon arriving at his New York hotel, that a stack of mail has accumulated from various U. S. firms who read his notice.

Foreign businessmen who may not be traveling to the U.S.A. are also advised to contact the nearest foreign post of the U. S. Department of Commerce. Here they can inspect copies of the "Foreign Commerce Weekly" and other periodicals listing business opportunities.

The Department has several offices throughout the U.S.A. which specialize in business activities within the specific areas. And they maintain libraries with literature on all aspects of American business.

The New York office of the U. S. Department of Commerce recently counciled a German gin distiller who was seeking areas in the U.S.A. with high concentration of German-Americans who would be particularly interested in his product. At the department's library, he found six such areas, and now has a thriving export business.

McGRAW-HILL INTERNATIONAL MANAGEMENT'S

Last-Minute Memos

Thin glass: A film of glass a thousand times thinner than a window pane is being used by the components division of International Business Machines Corp. to seal high reliability into tiny diodes and transistors.

Computer cooperation: France's Compagnie des Machines Bull, which has been reported to be looking for a U. S. partner for some time, has finally found one: the Radio Corporation of America. The two companies recently granted each other non-exclusive licenses to manufacture each other's data processing equipment. Under the agreement, Bull during the next three years will buy 50 to 100 R.C.A. computers—valued at an estimated $60-million—for marketing outside of the U. S. And R.C.A. will have the right to make and sell Bull's line of considerably smaller Gamma electronic data-processing equipment.

New Soviet jets? The Russians may be developing a new jet transport with aft-mounted engines in the Caravelle pattern, but with T-tail configurations similar to those designed for the Vickers VC 10, reports *Aviation Week*. Photographs of a recent Moscow military reception show a model of such a transport in the background. The airplane, which is much larger than a Caravelle, appears to be powered by two big turbojet or turbofan engines.

Changing Montreal: A giant business and financial center—costing about $90-million—will be built in Montreal jointly by Canadian and European financial interests. The first of three similar 51-story buildings, scheduled for completion in May 1964, will house the Montreal and Canadian Stock Exchanges.

Non-caloric beers: Two beers aimed at weight-watchers are moving into the U. S. beverage market, according to *Business Week*. A drink concocted by Fox Head Brewing Co., known as Fox Brew, foams up like beer but contains no alcohol. And an alcoholic but low-caloric beer, Trommers Red Letter, has been launched by Piel Bros.; it is priced at a fraction of a penny more per bottle or can than the Piel beer now being marketed.

Suggestion of prosperity: A shortage of dry-cargo ocean space resulting from a number of factors—political uncertainties, increased trade in the Far East, congestion at Japanese ports, Russia's demand for vessels—has lifted some of the gloom that has hung over shipbuilders and ship brokers for most of the past decade. London shipping experts expect the optimistic outlook to continue without interruption through the winter. And New York ship broker Jac. Pierot Jr. & Sons reports that owners of second-hand "Liberty ships" are holding on to these war-built freighters for higher prices. A Liberty in good condition has been selling for $364,000, but Pierot believes this price will be upped to $450,000 by the end of the year.

Permanent tires: Tires that last the life of an automobile will be available in two years, according to Dr. William J. Sparks, scientific advisor of the Esso Research & Engineering Corp. Addressing a group of chemists and chemical engineers in Chicago, U. S. A., Dr. Sparks noted that recent developments are permitting control of the chemical composition and molecular structure of rubber, so that molecules can be built exactly to the specifications of their end use.

Russian steels: Steels that withstand four times as much deformation and exhibit three times the elongation of conventionally-made steel have been developed in the Soviet Union, reports *American Machinist/Metalworking Manufacturing*. These properties are said to be attained by exposing the molten steel to supersonic vibrations.

New stock exchange: The boom in Japanese securities has led to the creation of a second major stock exchange, which will be installed in three major Japanese cities. And considerable study now is being given to the rules governing Japanese securities and shareholders. There is concern in Japanese financial circles that the Tokyo stock market is not governed strictly enough.

Inside American autos: U. S. automakers are using an increasing amount of imported parts and engines. Studebaker-Packard Corp. is getting connecting rods for the 1962 Lark from Dominion Forge Ltd., Windsor, Canada, and it may soon be having Lark grilles plated by another Canadian firm, Eastside Plating Co. Also, both Chrysler Corp. and White Motor Co. now are getting diesel engines from Perkins Engine Co. Ltd. of Peterborough, England: Chrysler for its Plymouth taxicabs, White for its new line of compact trucks.

India abroad: Jay Engineering Works of Calcutta, sewing machine manufacturer, will help businessmen in Pakistan, Ceylon, Burma, Thailand, and Viet Nam assemble its machines. With a sizeable export business, Jay is now setting up units abroad . . . Kirloskar Oil Engines Ltd. of Poona, with a growing diesel export business in South Asia, is taking aim at more industrialized markets. First target, the U. S. A.

Three-nation power project: A contract for a 242,000-kilowatt underground French-Belgium nuclear power plant, largest under the Euratom construction program, has been awarded to Westinghouse Electric International Co., of the U. S. A., Ateliers de Constructions Electriques de Charleroi, of Belgium, and Framatome, of France. The plant, scheduled for completion in 1965, is being built for SENA, which is owned jointly by Electricite de France, the French national utility, and by Centre et Sud, a group of six leading Belgian private utilities.

Coffee overproduction: As a militant attack on overproduction and dropping prices, Brazil has formulated a plan to destroy 1,000-million of its coffee trees during the next two years at a cost of about $180-million. The program would liberate 1.2-million hectares of good land for the production of corn, rice, menthol, vegetable oils, and the raising of hogs and dairy cattle. Another 1,000-million trees may be uprooted later, to make way for a smaller number of high-yielding varieties.

BUSINESS THROUGHOUT THE WORLD DEPENDS ON BURROUGHS

SHAW SAVILL AND ALBION CO. Ltd., world-wide passenger line, reports on the Burroughs Sensimatic.

"INSTALLING ONE BURROUGHS TYPING SENSIMATIC LOWERED OUR ACCOUNTING COSTS £2,000 PER YEAR"

"The greatest advantage of the Burroughs Typing Sensimatic accounting machine is its flexibility. We handle all ledgers, ships' voyage accounts, passage money, stevedoring accounts and payroll analysis on our machine. Installing just this one Sensimatic enables us to process our monthly financial accounts 20% faster. This reduced operating expenditures and lowered our costs by more than £2,000 per year. And Burroughs after-sales service enables us to get maximum efficiency from our Sensimatic." G. F. Kilpatrick, Chief Accountant for New Zealand, Shaw Savill, Wellington, New Zealand.

BRAZIL

HELENA RUBINSTEIN (Beauty products) reports from Rio de Janeiro, "Not only did the Burroughs Typing Sensimatic solve our stock accounting problem immediately, it helped reduce accounting costs by 38%."

BELGIUM

LEVIS PAINTS, S. A. reports from Vilvoorde, "Now with the Burroughs Sensimatic we get fast, accurate reports, and because we have virtually eliminated overtime work, we save 50% on accounting costs."

Burroughs

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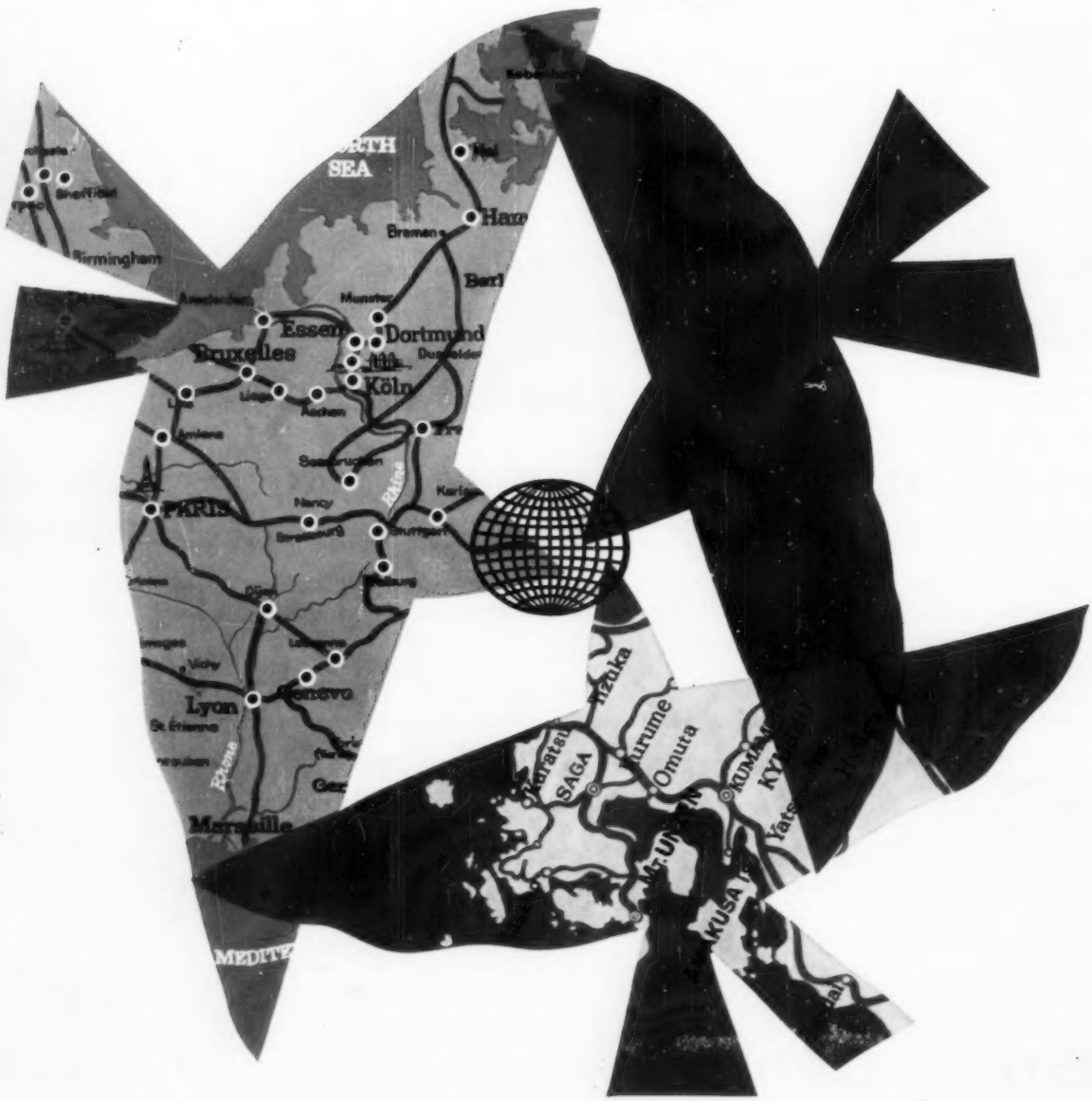
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